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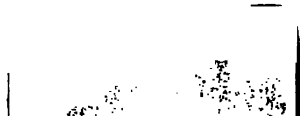
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THE
ANIMAL KINGDOM.



Fig. 1. by J. H. S. 1841

Sketch from a Roman Statue.



Head of a Female Savage.

INTERESTING FACTS
CONNECTED WITH THE
ANIMAL KINGDOM;
WITH SOME REMARKS
ON THE
UNITY OF OUR SPECIES.

BY JOHN CHARLES HALL, M. D.

FELLOW OF THE LINNÆAN SOCIETY; FELLOW OF THE ROYAL MEDICO-
BOTANICAL SOCIETY; AND MEMBER OF THE ROYAL COLLEGE OF
SURGEONS, LONDON; &c. &c. &c.

Man, the servant and interpreter of nature, can only understand and
act in proportion as he observes or contemplates the order of nature;
more he can neither know nor do.

LORD BACON,

Ουθεν ανθρωπω λαβειν μειζον, ου χαρισασθαι θεω σεμνοτερον, αληθειας,

PLUTARCH.

Than truth, no greater blessing can man receive, nor God bestow,

LONDON;
WHITTAKER AND CO. AVE MARIA LANE;

AND

T. BROOKE AND CO. DONCASTER.

MDCCCXLI,



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PRINTED BY T. BROOKE AND CO. HIGH-STREET.

TO

THE RIGHT HONOURABLE EARL SPENCER,

&c. &c. &c.

(WITH THE PERMISSION OF HIS LORDSHIP,)

THESE PAGES ARE DEDICATED

BY HIS MOST OBLIGED OBEDIENT SERVANT,

THE AUTHOR,

Could mankind be prevailed upon to read a few lessons from the great book of nature, so amply spread out before them, they would clearly see the hand of Providence in every page ; and would they consider the faculty of reasoning as the distinguishing gift of the human race, and use it as the guide of their lives, they would find their reward in a cheerful resignation of mind, in peace and happiness, under the conscious persuasion that a good naturalist cannot be a bad man.

BREWICK.

P R E F A C E .



THE following pages contain the substance of a course of Lectures on the Animal Kingdom, delivered at many of the scientific institutions of the metropolis. In considering the links by which the chain of animated nature is connected, an endeavour has been made to convey a brief outline of some of the various interesting facts, which must of necessity arise in such an investigation. The subject discussed is an extensive one, the objects presenting themselves numerous; still it must be pleasing to reflect, that such an important field for discovery is before us; the volume of nature lies open, and amply will it repay the most diligent research.

The examination of the Animal Kingdom belongs more particularly to the medical man; comparative anatomy is at present taught in the London Schools of Medicine, and some of the most eminent English physicians and surgeons, including Dr. W. Hunter, John

Hunter, Sir A. P. Cooper, Sir A. Carlisle, and Mr. Lawrence, have devoted a portion of their time to its study, doubtless remembering the remark of Celsus, *quamvis non faciat medicum aptiorem, tamen medicinæ reddit.*

The subject, however, is one of interest, not only to the members of that profession to which I have the honour to belong, but also to all classes of society. It is an endeavour to impart a knowledge of Natural History, and more particularly of man, and forms a part of the system of education at present existing in our public schools.

The subject is one of interest also, since it brings before us what is known respecting the varieties of the human race, furnishing a sufficient proof of the unity of the species, enabling us to combat the arguments of the sceptic, and to show that the Red Man, Black Man, and White Man, are united by the ties of blood, bound by the chain of relationship, and children of one common parent.

The works of Linnæus, Blumenbach, Cuvier, Lawrence, Dr. Prichard, and Dr. Morton, have been examined with great care and attention, and the facts they have collected, considered with the view of estab-

lishing the unity of our species. These facts fully bear out the above celebrated naturalists in maintaining the affirmative opinion; yet Virey has divided mankind into two species; Dumolins into eleven; and Borey de St. Vincent into no less than fifteen; whilst the French Professor Broc adds to these numerous sub-genera;—conclusive proof of the facility with which fantastic visionaries, can overleap the barriers of reason and of nature.

With this opinion of "*the unity of the species,*" our own must be in perfect harmony. The identity of organic function and structure, in all their most essential elements, is complete in every variation of mankind; and in such resemblance, is recognised a fact which is self-evident, a fundamental truth capable of the most perfect demonstration, an authority for positively maintaining the unity of the great human family. If it is attempted to divide the human race into numerous species, where is the proof of distinct and peculiar specific characters? It is not to be found. This conclusive authority is, and ever will be wanting, and the proposition remains the offspring of speculative assumption; conceived by fancy, brought forth by vanity, nurtured by arrogance, and unsustained by a single shadow of probable testimony, analogical or inductive.

These facts were first examined in order to bring them before the public at the Scientific Institutions of the metropolis. The flattering manner in which these lectures were received—the favourable criticisms of the London and provincial press, induced the author to examine more attentively the physical history of mankind. The materials he has been enabled to collect (compiled from notes made from time to time) are now laid before the reader, as nearly as possible in the words made use of in the Lecture Room.

I trust that I have sufficient love of science to lead me to desire nothing so much as the attainment of truth, and that I am not so vain as to believe that none of my views are erroneous. Indeed, one principal result of my labours, during a period of some years, in investigating the diseases of the human body, and the anatomical structure of man's frame, has been to convince me that life is not sufficiently long for these difficult researches; that the utmost which can be accomplished by the zeal and industry of an individual, is to make such progress in the study of his profession, as may enable those who come after him to carry their inquiries further; and that the expectations of any one who aims at higher objects than these, must terminate in disappointment.

It has already been stated, that these pages contain but an outline of this great kingdom of nature; nor is the author blind to their numerous imperfections; still if they remove from the path of the younger student some of the difficulties arising in this important investigation—if they prove the alphabet to the animal kingdom, unlocking the hidden treasures it contains—stimulating him to more extensive study—encouraging a more attentive examination of the subject;—if they remind the more advanced student of some things he may perchance have forgotten—if they afford a few hours' amusement and instruction—if they lead the mind to a sincere and earnest endeavour to search for truth, my object in writing them will have been more than crowned with success.

NORTHAMPTON, 1841.

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EXPLANATION OF THE PLATES.

PLATE I.—The head of a Savage of Prince William's Sound, contrasted with the head of the celebrated colossal figure, by Michael Angelo, in the Sistine Chapel.

PLATE II.—*Simia Seniculus*, (red howling monkey,) belonging to the second order, (*Quadrumana*). According to the classification followed by Cuvier in the second edition of his *Règne Animal*, (published in 1829,) there are three principal genera enumerated, viz. I. *Simia* (Linnæus), II. *Hapale* (Illiger), and III. *Lemur* (Linnæus). The first and last of these contain so many sub-genera and species, that it would be better to let them rank as distinct families; for *Simia* has fifteen sub-genera, *Lemur* five, while *Hapale* has only two, which however contain more than eight different species. The first eight sub-genera of *Simia* inhabit the Old World, the others are found in America, and have received the general appellation of *Sapajous*, (*Cebus*, of Erxleben). The plate gives a correct representation of the fine specimen in the Museum belonging to the Richmond Literary and Scientific Institution.

PLATE III. Exhibits Camper's investigation of the facial line. The first figure is that of an Orang-outang (*Simia Satyrus*), the facial angle of whose head is about 58 degrees.* Fig. 2, a Grecian Antique, the facial angle of which is about 100 degrees. Fig. 3. is that of a Negro, the facial angle about 71 degrees. Camper's rule for finding this angle is as follows: Supposing the skull to be placed in profile, a line is to be drawn from the most projecting part of the forehead to the most prominent portion of the upper jaw-bone; a second line is now to be drawn horizontally passing immediately under the ear and nose, and the angle formed by these two lines is the facial angle. The extremes for the obliquity of the facial line in the human race, range from 70 to 100 degrees, which will comprise every gradation, from the Negro to the beauty of the Grecian Antique. If the scale is followed still lower, the head of a monkey, a dog, and a snipe, will appear in succession.

PLATE IV. Fig. 1. Is a very correct representation of the skull deformed during infancy by artificial means, which is in the Museum of the Royal College of Surgeons. It was brought from the vale of Titicaca, in the highlands of Peru. A very careful examination of this skull leaves no doubt of its having been elongated by pressure. (There is also another skull of this kind in the Museum at Guy's Hospital.) I have no doubt Mr. Owen, the distinguished curator of the College of Surgeons, will allow any gentleman to examine it who may feel interested in these investigations.

Fig. 2. Is a drawing of a skull in my possession, and is here given for the purpose of showing, by comparison with the upper one, the great alteration the cranium undergoes by the process already mentioned.

* Camper is wrong; according to Owen the angle is only 30.

PART THE FIRST.

CHAPTER I.

CLASSIFICATION.

A VERY attentive examination of the following Tables is requested, as it will be necessary to do so in order to follow investigations hereafter entered into.

TABLE I.

DIVISIONS OF THE ANIMAL KINGDOM.

		ANIMALIA.	
DIVISION.			CLASS.
	I. VERTEBRATA ...	}	1. Mammalia.
			2. Aves.
			3. Reptilia.
			4. Pisces.
}	II. MOLLUSCA	}	1. Cephalopoda.
			2. Pteropoda.
			3. Gasteropoda.
			4. Acephala.
			5. Brachiopoda.
			6. Cirrhopoda.
	III. ARTICULATA	}	1. Annelides.
			2. Crustacea.
			3. Arachnides.
			4. Insecta.
IV. RADIATA	}	1. Echinodermata.	
		2. Entozoa.	
		3. Acalephæ.	
		4. Polypi.	
		5. Infusoria.	

All Animals may be included in one or other of the above classes.

EXPLANATION OF TABLE, No. 1.



DIVISION I.—VERTEBRATA.

CLASS I.—MAMMALIA.

- I. *Bimana* . . . Man.
- II. *Quadrumana* . . Monkey, ape, lemur.
- III. *Cheiroptera* . . Bat, colugo, &c.
- IV. *Insectivora* . . Hedgehog, shrew, mole.
- V. *Plantigrada* . . Bear, badger, glutton.
- VI. *Digitigrada* . . Dog, cat, lion, martin, weasel, otter.
- VII. *Amphibia* . . Seal, walrus.
- VIII. *Marsupiata* . . Kangaroo, wombat, opossum.
- IX. *Rodentia* . . . Hare, beaver, rat, squirrel, porcupine.
- X. *Edentata* . . . Sloth, armadillo, anteater, &c. &c.
- XI. *Pachy-dermata* . Elephant, rhinoceros, tapir, horse.
- XII. *Ruminantia* . { Camel, giraffe, ox, sheep, goat, antelope,
Deer.
- XIII. *Cetacea* . . . Whale, dolphin.

CLASS II.—AVES.

- I. *Accipitres* . . Eagle, vulture, owl.
- II. *Passeres* . . . Thrush, crow, sparrow, wren.
- III. *Scansores* . . Parrot, woodpecker, cuckoo.
- IV. *Gallinæ* . . . Pheasant, peacock, pigeon, grouse.
- V. *Grallæ* . . . Plover, stark, snipe, flamingo.
- VI. *Palmipedes* . . Swan, duck, gull, pelican.

III. Animals whose hearts have but two cavities—Fishes and most Mollusca.

IV. Animals having a heart with one cavity—Articulated Animals.

V. Creatures in which the same organ performs the office both of stomach and heart, as in the Medusæ. The best example of the ciliated Medusa is furnished in the Girdle of Venus (*cestum Veneris*). The animal is like a piece of tape, long, gelatinous, and flat; its margins are fringed at the sides with numerous small hairs; it emits by day the most lovely iridescent colours, and by night it is tinted with phosphorescent rays.

INVERTEBRATA.

DIVISION II.—MOLLUSCA.

The Mollusca require also our attentive examination. The animals in this second grand division of the Animal Kingdom are either naked or testaceous. They are divided into six classes, each of which will briefly be explained.

- I. Cephalopoda.
- II. Pteropoda.
- III. Gasteropoda.
- IV. Acephala.
- V. Brachiopoda.
- VI. Cirrhopoda.

CLASS I.—CEPHALOPODA. Cuttle fish, calamary, nautilus.

This class, named from the long prehensile arms which surround the head, includes but one order designated by the same name. It is, however, divided into six genera.

CLASS II.—PTEROPODA. Clio Hyalæa.

The feet, or rather the organs, of locomotion appear like fins. It contains like the last but one order.

CLASS III.—GASTEROPODA. Slug, snail, limpet, wheld.

Includes the reptilious mollusca. They are naked or testaceous, although the shell is not always sufficiently large to cover the body. This class is again divided into eight orders.

CLASS.	ORDER.	REMARKS.
Gasteropoda	I. Pulmonaria . .	{ Breathe by internal lungs instead of gills.
	II. Nudibranchiata . .	{ Have uncovered gills on the back.
	III. Inferobranchiata . .	{ Gills on the lower sides of the body.
	IV. Tectibranchiata . .	{ Gills like leaflets on the right side or back.
	V. Heteropoda . .	{ Named from the peculiarity of the foot, which is formed into a vertical muscular lamina.
	VI. Pectinabranchiata . .	{ Pectinated gills filling the last whorl of the shell.
	VII. Scutibranchiata . .	{ In this class the shell is not turbinated, and is in fact little more than a defence to the gills.
	VIII. Cyclobranchiata . .	{ The gills are placed in the form of leaflets under the edge of the mantle.

CLASS IV.—ACEPHALA. Oyster, muscle, acidia.

We have described this class in another part of the book. It is divided into two orders, 1. *Acephala Testacea*, to which many multivalves and all the bivalves belong. 2. *Acephala Nuda*. These are without a shell.

CLASS V.—BRACHIOPODA. *Lingula*, *terebratula*.

In this as in the last class the mantle has two lobes, and it is always open; instead of feet we find fleshy arms with numerous filaments which can be drawn into the shell at pleasure. All the genera are bivalves.

CLASS VI.—CIRRHOPODA. Barnacle.

This class resembles the *articulata*; the animals are furnished with jaws, and the abdomen with *cirri* or filaments in pairs not unlike those under the tail of many crustacea.

DIVISION III.—ARTICULATA.

In this division are found four classes; the body, and with few exceptions the limbs, are encased in articulated rings which support the soft parts and give points of attachment to the muscles. It is divided as in our table into four classes.

CLASS I.—ANNELIDA. Worms with red blood.

This class contains three orders, 1. *Tubicola*: 2. *Dorsibranchiata*. 3. *Abranchiata*. It is only necessary to remark that the *Tubicola* form tubes to live in, either of calcareous exudations from their own body or from foreign substances. They are not, however, like some of the testaceous *Mollusca*, fixed to their tubes.

CLASS II.—CRUSTACEA.

These classes of Articulata have articulated feet or legs. This class is divided into two sections, 1. Malacostraca, again divided into five orders; 2. Entomostraca, (shell insects) containing two orders.

I. SECTION.	ORDER.	REMARKS, EXAMPLE OF SPECIES, &c.
Malacostraca	CANCER. {	I. Decapoda . . . (Crab, lobster, prawn.
		II. Stomapoda . . . (Squill, phyllosoma.
		III. Amphipoda . . . (Gammarus, sandhopper.
		IV. Lœmodipoda . . . (Whalelouse, &c.
		V. Isopoda . . . { Includes the aniscus syl- vestris, or woodlouse, &c. &c.
II. SECTION.	ORDER.	REMARKS.
Entomostraca	{	I. Branchiopoda {
		II. Pœcilopoda . {

Before leaving this class, a remark may be made on the singular fossils called Trilobites, supposed to be allied to Entomostraca. It includes the Agnostus (Brong), Calymene, Asaphus, Ogygia, &c. &c. &c.

CLASS III.—ARACHNIDA.

Divided into two orders.

- I. Pulmonariæ . . . The spider, tarentula, scorpion.
- II. Tracheariæ . . . Phalangium, mite.

CLASS IV.—INSECTA.

The insects are again divided into twelve orders.

CLASS.	ORDER.	REMARKS.
Insecta	*I. Myriapoda .	Centipede, podura.
	II. Thysanoura .	{ Lepisma, spring tails, (saccharina of Linnæus,) &c.
	III. Parasita . .	Louse, &c. &c. &c.
	IV. Scutoria . .	Flea, &c.
	V. Coleoptera .	Glow-worm, beetles, &c.
	VI. Orthoptera .	Grasshopper, locust, &c. &c. &c.
	VII. Hemiptera .	Fire-fly, (aphis).
	VIII. Neuroptera .	Dragon flies, (ephemera).
	IX. Hymenoptera	Bees, ants, wasps.
	X. Lepidoptera .	Butterflies and moths.
	XI. Rhipiptera .	Xenos, stylops.
	XII. Diptera . .	Mosquitoes, &c. &c.

An example of the development of insects may be given in the Lepidoptera, (butterflies and moths). The butterfly deposits a small egg not larger than a grain of mustard-seed. This gives birth to a caterpillar having the external appearance and mechanical structure of a worm (moved by no less than four hundred muscles), with this difference, viz. containing in its interior the rudiments of the future insect, concealed however from view by a great number of membranous coverings which are one after the other thrown off. While wearing this disguise the insect is termed larva, a name derived from the Latin; larva signifying a mask. Another change now takes place; the whole of the coverings of the body being cast off, the insect next assumes the form of a pupa, or chrysalis, being covered by a shroud, presenting no appearance of external members, and retaining but feeble indications of life. In this condition it remains some time longer, perfecting in secret the development of its organs; until the period arrives, when emerging from its prison, bursting the fetters

* Rymer Jones does not place Myriapoda under Insecta. The name is derived from the Greek signifying many feet.

with which it was bound, the worm has become furnished with wings, which enable it to rank among the gay inhabitants of the air, and with rapidity to soar onward from flower to flower, to waft itself from place to place, to visit new scenes of pleasure and delight.

DIVISION IV.—RADIATA, OR ZOOPHYTES.

This fourth or last division of the Animal Kingdom includes the most simple forms of animated nature, and although it is divided into several classes, each is observed to exhibit traces, in a greater or less degree, of radiation from a common centre. It includes five classes.

DIVISION.	CLASS.	REMARKS, EXAMPLES OF SPECIES, &c.
Radiata	I. Echinodermata	Star-fish, urchin, echinus.
	II. Entozoa . . .	{ Intestinal worms, fluke, hydatid, tape-worm.
	III. Acalephæ . . .	Actinia, medusa.
	IV. Polypi . . .	Hydra, coral, madrepore, pennatula.
	V. Infusoria . . .	Brachionus, vibrio, proteus, monas.

CLASS I.—ECHINODERMITA.

Under this name, says Cuvier, "strictly speaking is included the genus Echinus, sea-urchin, or hedge-hog," but its more general application is to the most complicated of the radiated animals. All the genera have a well organized skin with distinct viscera, and a sort of imperfect vascular system. This class includes two orders, 1. Pedicellata. 2. Aphedicellata.

ORDER I.—PEDICELLATA.

The covering in this order is pierced with apertures through which issue numerous membranaceous tentacula, which acting as organs of motion are called feet. The second order does not demand any particular explanation.

CLASS II.—ENTOZOA, OR INTESTINA.

As far as our present knowledge enables us to speak, this class is destitute of any true circulation, though there are faint traces of nerves. Most of the genera live only in the interior of other animals. They may be divided into two orders.

CLASS.	ORDER.	REMARKS.
Intestina	I. Intestina cavitaria . .	Nematoidea, rudolphi.
	II. Intestina parenchymata	Divided into four families.

CLASS III.—ACALEPHA.

Commonly known as sea-nettles. They possess some appearance of internal vessels, which, however, are mere productions of the intestines in the interior of the body. It contains two orders, 1. Acalephæ simplices. 2. Acalephæ hydrostaticæ. The latter are distinguished by air vessels or bladders by which the animals are usually suspended in the water.

CLASS IV.—POLYPI.

We find in this class tentacula which surround the mouth. Most of the genera propagate by off-shoots as well as by eggs. It includes three orders, viz.—

CLASS.	ORDER.
Polypi	I. Polypi carnosi.
	II. Polypi gelatinosi.
	III. Polypi polypiferi.

ORDER I.—POLYPI CARNOSI.

They are also called sea nettles. They have a fleshy envelope and are generally fixed, but occasionally free.

ORDER II.—POLYPI GELATINOSI.

Are without any general covering, and are gelatinous. Their body represents a mere bag.

ORDER III.—POLYPI POLYPIFERI.

In this order the animals are composite, inhabiting in numbers a single habitaculum or polyparia, with a community of nutriment and volition.

Polypi form a very extensive order of zoophytes abounding in every part of the ocean, but growing in the greatest abundance in the warmer regions of the globe. Their flesh exhibits the same granular appearance as that of the sponge, but is firmer and not unfrequently mixed with calcareous matter; like the sponge tribe they are for the most part attached to some inorganic body or base, which may be either horny or calcareous; the form of this base admits of endless variety. In some tribes this basis of support is internal, consisting of a skeleton or axis, the polypous mouths being spread at intervals over the surface of the fleshy layer covering the skeleton. This is the case with the gongonia antipathes and coral, which exhibit the closest resemblance to the branched forms of vegetable stems. In many cases the polypi are lodged in cup-like depressions in the calcareous axis which affords them protection. In madrepores these depressions are crossed by radiating plates adapted to the form and number of the tentacula. In the millepores the cells are closer and the star-like radiations are wanting.

CLASS V.—INFUSORIA.

Animalcules or infusoria, so named by Muller from the circumstance of their swarming in all infusions of animal or vegetable substances if kept sufficiently long. They are in general far too minute to be examined by the naked eye; they present an extreme simplicity of organization; some however have a more

complicated structure. The class is divided into two orders,
1. Rotifera. 2. Homogenea.

ORDER I.—ROTIFERA.

Bodies oval and gelatinous. A mouth, stomach, intestines, and arms have been discovered. The mouth or head is surrounded by denticulated lobes which vibrate with great rapidity, and under the microscope present the appearance of a revolving wheel.

ORDER II.—HOMOGENEA.

Body gelatinous, but without any appearance of stomach or intestines, and in some a mouth cannot even be discovered.

The scientific reader wishing for additional information on the classification of Cuvier, may consult the writings of Mr. Edward Griffiths. The limits of this work compel the above arrangement.

TABLE II.*

GENERAL VIEW OF THE GLOBE AS CONSISTING OF LAND AND SEA.

- I.
The great South Eastern basin, the waters of which cover nearly half the globe. It includes
1. The Antarctic Ocean, which is comprised within the Antarctic Circle, that is between the parallel of $66^{\circ} 32'$ of southern latitude and the South Pole.
 2. The Southern Ocean, the boundary of which on one side is the Antarctic Circle, on the other a line drawn from Cape Horn to the Cape of Good Hope, thence to Van Diemen's Land, and again by the south of New Zealand to Cape Horn. This line forms the southern boundary of Nos. 3 and 4.
 3. The Indian Ocean, lying between Africa on the west, and the peninsula of Malaya with the islands of Sumatra, Java, &c., and New Holland, on the east, and bounded by Persia and Hindustan on the north. The Red Sea, or Arabian Gulf, the Persian Gulf, and the Bay of Bengal are all parts of this ocean.
 4. The Pacific Ocean, divided by the equator into North and South, and inclosed between America on the east, and New Holland, the islands of Java and Sumatra, and the continent of Asia, on the west. On the north it terminates at Behring's Strait. The seas of China, Japan, Okhotsk, &c. form parts of this ocean.

* From the Philosophical Transactions.

II.
The West-
ern basin,
forming a
channel be-
tween the
old and new
continents.

1. The Atlantic Ocean, commencing in the south from a line drawn from Cape Horn to the Cape of Good Hope, and terminated on the north by the Arctic Circle. It is divided into North and South by the equator, and its branches are the Mediterranean, the North Sea or German Ocean, the Baltic, Baffin's Bay, Hudson's Bay, the Gulf of Mexico and the Caribbean Sea.

2. The Arctic Ocean, surrounding the North Pole, and bounded by the Arctic Circle and the northern shores of the two continents. The White Sea, the Sea of Kara, and the Gulf of Obe are parts of it.

The Ocean is spread over nearly seven-tenths of the globe ; but it is remarkable how unequally the land and water are distributed. If we look at a map of the world projected upon the horizon of London, in which map, consequently, London forms the centre of the one hemisphere and the antipodes* to London the centre of the other ; the first hemisphere, it will be seen, contains a very large proportion of the whole of the land, while the second, if we except New Holland and the extremity of South America, from the twenty-ninth degree of south latitude, consists almost entirely of water. The distribution of water and land is still very unequal, if we compare only the northern and southern hemispheres, that is, the two equal parts into which the globe is divided by the equator. The following calculation will plainly exhibit this fact :

Considering the whole space included in the northern part of the torrid zone, as equal to 1, the proportion of land is	0.297
On the same supposition, the proportion of land in the northern temperate zone is	0.559
And in the northern icy zone	0.400

* As all island, lying to the south-east of New Zealand, and called Antipodes island, is very nearly the antipodes to London.

In the southern part of the torid zone, the portion of
land is 0.312
In the southern temperate zone 0.075
In the southern icy zone (supposed) none.
In other words, if the quantity of land in the northern hemisphere be represented by 16, the quantity in the southern will be scarcely equal to 5.

About the middle of the last century it was asserted that a great continent must exist towards the south pole, in order to counterbalance the mass of land in the northern hemisphere; but by the voyages of Cook and others, it has been proved that the high southern latitudes contain only a few islands.—The absence of a continent near the south pole does not of itself prove that there is less land there than in the north, since it is possible that the land in general may be only rather more depressed in the south, the necessary result of which would be, that the ocean would spread itself more extensively over the surface of the earth in that quarter.

PART THE SECOND.

CHAPTER II.



THE ANIMAL KINGDOM—DISPERSION OF THE DIFFERENT SPECIES.

*“ Link after link the vital chain extends,
“ And the long line of being never ends.”*

IN the world around us we cannot but discover many very remarkable and evident distinctions between living beings and inanimate objects. The most evident and apparent of such distinctions are doubtless built rather upon a comparison of their mode of existence than upon an examination of their intimate structure. The ceaseless tendency to change manifested in the life of the former, stands in yet more obvious contrast with the unaltering stability of the latter than does that peculiar arrangement of elementary principles which is called organization, with the regular aggregation of the ultimate atoms which the inorganic world presents. The snow-crowned mountain rises towards the sky of heaven unaffected by the lapse of ages which have rolled over it since its first elevation—since first summoned from chaos by the finger of the Omnipotent;

there it remains a monument of nature's power, and the giant edifices erected by the hands of man upon the sands of Egypt, remind us of the wealth and grandeur of a nation now blackened by the darkest shades of ignorance and superstition; now sunk into poverty and insignificance; faded the light that beamed upon them in other days, and set the bright sun of their former glory! And what in comparison with the permanence of these is the duration of any structure, subject to the usual laws of vitality? To be born, to grow, to arrive at maturity, to sink into decay, to moulder into dust, is the sum of the history of every living creature that exists; from man (as regards his condition in this transitory sphere) in the pomp of royalty and the pride of learning and philosophy, to the gaily painted butterfly, which glitters for a few fleeting hours in the sunbeams, and is seen no more;—from the stately oak, monarch of the forest through successive ages, to the humble fungus that springs up in an hour, and withers in a day. How truly, how eloquently, how impressively, are these changes described by the sacred writer! "Our life is as a vapour, that appeareth for a little time and then vanishes away."* And yet amid this

* A modern writer has thus beautifully expressed the same opinion as to the uniformity of the operations of Nature:—The lark now carols the same song, and in the same key, as when Adam first turned his enraptured ear to catch the moral. The owl first hooted in B flat, and it still loves the key, and it screams through no other octaves. In the same key has ever ticked the death-watch; while all the three noted chirps of the cricket have

constant change and succession of individuals, the form and character first impressed by the Creator of all is uninterruptedly transmitted from parent to offspring: "one generation passeth away," but another

ever been in B since Tubal Cain first heard them in his smithy, or the Israelites in their ash ovens. Never has the buzz of the gnat risen above the second A; nor that of the house-fly's wing sunk below the first F. Sound had at first the same connexion with colour as it has now; and the right angle of light's incidence might as much produce a sound on the first turrets of Cain's city, as it is now *said to do* on one of the pyramids. The tulip, in its first bloom in Noah's garden, emitted heat, four and a half degrees above the atmosphere, as it does at the present day. The stormy Petrel as much delighted to sport amongst the first billows which the Indian Ocean ever raised, as it does now. In the first migration of birds, they passed from north to south, and fled over the narrowest part of the seas, as they will this autumn. The cuckoo and the nightingale first began their song together, analogous to the beginning of our April, in the days of Nimrod. Birds that lived on flies laid bluish eggs in the days of Joseph, as they will two thousand years hence, if the sun should not fall from his throne, or the earth not break her harness from the planetary car. The first bird that was caged oftener sung in *adagio* than in its natural spirit. Corals have ever grown edge-ways to the ocean stream. Eight millions two hundred and eighty thousand animalculæ could as well live in a drop of water in the days of Seth as now. Flying insects had on their coats of mail in the days of Japhet, over which they have ever waved plumes of more gaudy feathers than the peacock ever dropped. The bees that afforded Eve her first honey made their combs hexagonal; and the first house-fly produced twenty millions eighty-three hundred and twenty eggs in one year, as she does at present. The first jump of the first flea was two hundred times its own length, as it was the last summer. There was iron enough

cometh; like in form, structure, habits, and the limits of its existence. The mistletoe flourishes upon the oak of our forests just as when an object of superstitious awe and veneration, in the hallowed groves of our Druidical ancestors; the bee builds her comb with the same unvarying regularity, and fills her hive with the same delicious honey, as when her beautiful works attracted the notice of the poet and the philosopher in classic ages, now unhappily no more; and man, however modified by education, however exalted his condition of mental and moral refinement, is yet born the same helpless, dependant being, with the same dormant faculties of mind and body, as the first offspring of our original parents.

The most superficial observers are in the habit of remarking certain great and striking differences in the nature, structure, and qualities of the bodies by which they are surrounded. They see at once that a stone is something very different from a plant, and a plant something very different from an animal, although they do not tax themselves to consider in what this difference specifically consists. It is both natural and convenient for the multitude to class things together according to

in the blood of the first forty-two men to make a ploughshare, as there is to-day, from whatever country you collect them. The lungs of Abel contained a coil of vital matter one hundred and fifty-nine feet square, as mine; and the first inspiration of Adam consumed seventeen cubic inches of air, as do those of every adult reader. The rat and the robin followed the footsteps of Noah, as they do ours.

their most striking characteristics, and in this way they may come to the use of a certain arrangement of natural bodies, not founded upon a knowledge of their intimate nature and essential qualities, but upon those properties only which produce the most lively impressions upon our senses, after a very imperfect examination. Thus have been established the mineral, vegetable, and animal kingdoms, which include under them all the objects of the material world. It will easily be understood that such an arrangement is founded upon an examination of those objects alone which are within our immediate observation, and with whose qualities and properties the mind is most familiar. It is seen that mountains and rocks are immoveably fixed to the same spot, and remain always of the same size,—that the earth does not change its surface except by the action of violent and unusual causes.* Plants

* There are dispersed over the surface of the globe upwards of 40,000 distinct species of plants which bear flowers; and from the number recently discovered by the industry of collectors, it cannot be supposed that any thing like the entire number is as yet known to those best skilled in plants. The great number of flower-producing vegetables is variously distributed over the different regions according to the several climates, latitudes, and character of soil. The usual estimate is that there are upwards of 13,000 flowering plants natives of the intertropical parts of America. In Australia and the numerous islands with which the wide expanse of the Pacific is studded, either within the tropics or not very far without them, there are about 5,000 species already known, though some of the largest and most tropical of these islands are as yet imperfectly explored. Temperate America in both hemispheres contains about 4,000; and Europe, which lies wholly within the temperate zone, contains at least 7,000 distinct species of plants which bear flowers.

on the contrary are undergoing constant and spontaneous changes. Some are sprouting up from the earth, coming forth as it were from a new creation; giving existence to a new set of individuals like themselves,—then dying and sinking into decay. Next we observe animals coming into the world; living, growing, giving life to other animals, and exercising various active offices; feeling, moving, uttering sounds, suffering and enjoying, establishing a thousand connexions with things and beings around them which contribute to the support or happiness of their existence. In this way the attention may be drawn to a division of created things into the three great classes already mentioned. It is sufficient for the general and popular purposes to which it has been applied, but a more minute examination proves it to be neither strictly nor scientifically correct. In examining the distribution of the lower divisions of the Animal Kingdom, the line dividing the animal from the vegetable state of existence will be so closely approached, that it will be necessary at once to endeavour to form a correct idea of the point at which the one ends and the other arises. In the seventeenth century Jungius described a plant “as a living body (not sentient) affixed to a certain situation whence it can derive nourishment, grow and increase its species.” Boerhaave defined a plant as “an organic body fixed to some other body by some part of itself.” Ludwig remarks that “natural bodies having always the same form, and endowed with powers of locomotion, are called animals, those having always the same form, but wanting the ability of moving from place to place,

vegetables." This power of locomotion has been regarded in all the above descriptions as conclusive proof of the difference between the members of the two kingdoms. It is not correct, for many members of the Animal Kingdom, as sponges and corals, remain for ever fixed to the rocky bed on which they first came into existence; a want of locomotive power, therefore, cannot be regarded as a distinguishing characteristic of vegetable life.

Linnæus writes, "stones grow, vegetables grow and live, animals grow, feel, and live." This opinion has been disputed by Sir J. C. Smith in his Introduction to Physiological and Systematical Botany. He thinks vegetables may possess sensation, adding, "nor could the consequent uneasiness which plants suffer no doubt in a small degree from the depredations of animals bear any comparison with their enjoyment on the whole." Mirbel observes, "that plants have the power of deriving nourishment from inorganic matter, which is not the case with animals who feed on animals and vegetables, or both, but are never nourished on earth, salt, or air." This reasoning is ingenious and plausible, but it contains an assumption which cannot be allowed to the extent required; for if by "*inorganic matter*" is to be understood simple earth and salts which do not form parts of decayed organized bodies, this opinion of Mirbel is incorrect; nor are we prepared to admit that air is imbibed as food by plants. What soil composed of simple earths and devoid of animal and vegetable matter, can be found in which plants will grow? A plant, it is true, may be reared in pure water, or in

stones moistened with water, but in this case the water is the support of the plant; and many animals, for example the Infusoria, are supported by water alone.

As this fluid is the universal solvent, whatever it contains in solution may be taken up by the vegetable vessels, and Sir Humphrey Davy has proved that even distilled water may contain saline and metallic impregnations; this being the case, it is easy to discover the source whence the alkalies, salts, metallic oxides, and earths, found in plants, are derived; and again the water which nature furnishes to plants is never perfectly pure, for besides containing air, in which there is constantly a portion of carbonic acid gas, it has always acquired by percolation through the soil various earthy and saline particles, in addition to the remains of decayed vegetable and animal substances; many of these are soluble in water, and others may be suspended in it, in a state of division sufficiently minute to enter with this fluid into the vegetable system.

Doctor Alston makes the distinguishing characteristic of vegetables to consist in the absence of an internal stomach. Animals deriving nourishment from their internal, and plants from their external surface.

Professor Rymer Jones expresses in other words the same opinion.* "The best definition of an animal as distinguished from a vegetable is, that whereas the latter is fixed in the soil by roots, or immersed perpetually in the fluid from which it derives its nourish-

* Outline of the Animal Kingdom.

ment, absorbs by its whole surface the nutriment which it requires; the animal being in a greater or less degree capable of changing its position, is furnished with an internal receptacle for food or stomachical cavity, from which after undergoing the digestive process the nutritive portion is taken up." Of the truth of this opinion there can be no doubt. Returning, however, from the examination of the above theories to the three kingdoms of nature, a more accurate and philosophical division of natural objects will be, *into such as are possessed of life, and such as are destitute of vitality.* This places before us inorganic and organic bodies; the first division including all bodies which submit to the general laws of chymical affinity and of mechanics, and which do not contain life, as *gases, fluids, earths, salts, and met.als*; the second containing living beings, as *animals and vegetables.*

I. *Living bodies are distinguished from other substances in the mode of their origin:* they are always the offspring of parents. This is a very obvious and complete distinction. No mineral, no body without the germ of life is ever brought into existence in this way. One stone produces not another; a crystal does not produce a crystal, nor one grain of sand another. There is nothing in this like the relation between parent and offspring.

II. *Living bodies differ as to the mode of their existence,* inasmuch as they depend upon things around them for the continuance of life. The materials of which they are composed are constantly changing; this loss must be repaired by the addition of new substances; hence the necessity for food, which being operated

upon by the organs of the animal or vegetable is assimilated to it, and its properties modified until this nourishment becomes fit to form a part of the living body. Minerals on the contrary have no such dependance; the matter of which they consist is always the same.

III. *Living bodies contain within themselves a principle by which they are enabled to resist directly the operations of those laws which otherwise would insure their speedy annihilation.* They depend upon things around them for their support, but the power of altering those materials and appropriating them to their own use is peculiar to themselves.

IV. *Another distinction of living substances is furnished by the knowledge that they always terminate in death.* By this event the materials which entered into their composition are deprived of the bond which held them together and gave to them their peculiar form, viz. the principle of life. They consequently separate, retaining only those properties which they possessed before they became parts of a living system,—dust returns to that dust whence it was taken. These are circumstances of distinction common to all living bodies, animal or vegetable. It is needless to examine more minutely the points of distinction between the two latter, the opinion of Professor Rymer Jones is conclusive. Physiologists have not unfrequently laboured to discover in what such difference consists, and have generally failed because they expected to find this distinction in one single principle, admitting of a short and specific definition. Such a principle can be only ideal, and it would not be difficult to confound in

the same way the boundaries of living and dead matter. This distinction must be sought in the general structure, the general mode of existence, and the purposes of existence in the two. In fact the substance of what is sought to be conveyed may be given in few words, by saying that animals differ from plants in being furnished with internal organs for the purpose of digesting food, instead of absorbing it by roots which are placed in the earth; in being furnished for the most part with organs enabling them to move from place to place; in having powers of sensation, perception, and volition, by which they acquire a knowledge of the existence and qualities of other bodies besides themselves, and in being obviously intended by the possession of these organs and powers to be conscious of, and to enjoy existence.

A minute and careful consideration of this part of the subject, has shown the advantage of examining things of the most apparently trifling import, as they are often found to lead to the most important results. They are like the marks in the forests by which an Indian detects the presence of friends or foes. A broken stick, a torn leaf, a flattened blade of grass, are signs many would pass over unnoticed; but to the practised eye of a denizen of the woods they are alike certain and expressive; the key to the alphabet, by which he reads the book of nature. And so in ascending each succeeding step of the ladder of existence new relations are comprehended between facts, which before appeared confused and isolated; new objects for things that at one time appeared destitute of utility; new reasons for appreciating the wisdom of a Creator

whose goodness is best discovered in studying his works, and whose works an eternity would be insufficient to explore; new reasons for believing that Nature is but a name for an effect, whose cause is God.*

* Mr. Ginty, in his "Practical Chymist," draws a very good distinction between animal and vegetable bodies:—

1st. Vegetables and animals are distinguished from all other substances by having the principle called life. 2d. They are nearly all composed of the same elements combined in different proportions. 3d. They are all decomposed by a red heat. 4th. They cannot be produced by art.

The necessary ingredients of vegetables are carbon, hydrogen, and oxygen, in addition to which some contain nitrogen. These ingredients constitute the ultimate elements, and their separation from each other constitutes what has been called ultimate analysis.

The elements of vegetables are so combined in nature as to constitute distinct and definite compounds which exist already formed in the plant, and are denominated proximate principles.

The principles are 1st. Vegetable acids, nearly all these may be obtained in crystals at common temperatures. 2d. Oils characterized by a peculiar unctuous feel, inflammability, and by their insolubility in water. 3d. Sugar, contained in ripe fruits, in the sap of many trees, and in the roots of some vegetables. 4th. Starch, an abundant product of the vegetable kingdom, being the chief ingredient of most varieties of grain and of some roots. 5th. Gum, found in a great variety of plants and trees. 6th. Vegetable alkalies. These substances, according to Dumas, besides containing oxygen, hydrogen, and carbon, also contain nitrogen. They are supposed to exist in the plant in combination with some native vegetable acid constituting a salt; to obtain the vegetable alkali, therefore we have only to present some stronger alkali that will combine with the native acid, the vegetable alkali being set free will, from its insolubility, be precipitated. 7th.

Thus has it been proved, that plants in common with animals possess a vitality which distinguishes them from inert matter and displays itself by its effects. But if the inquiry is extended beyond the examination of these effects — if a solution be sought to the question, what is vitality? I pause — pause to acknowledge the inefficacy of human knowledge, of human wisdom, and of human power, to unravel those great mysteries, which doubtless for some good reason the Author of Nature has thought proper to conceal. It is known, however, that vitality is attached to organization, but it does not depend upon structure; neither is it caloric the cause of heat, although with this agent it has the closest possible connexion; nor is it chymical affinity, for in organized bodies it resists the changes which affinity produces among its components when vitality ceases. The flights of fancy fail us in forming any conjecture as to its nature; we search in vain for a

Colouring matter. Most colours require the agency of something to fix them firmly, otherwise they would be destroyed by washing; such agents were formerly called Mordants, but the term base is now more generally substituted. The chief bases employed are alum, coppering, and muriate of tin, of which large quantities are used by the dyer. These not only fix the colour, but give them often a brighter and different hue. 8th. Tannin, a brown powder, existing in large quantities in all astringent plants. 9th. Gluten, a substance obtained in the process for preparing starch. 10th. Yeast or emtins. The latter name was given from its being the dregs, left after pouring off beer, and formerly called emptyings, it is produced during vinous fermentation, and is itself the principle of fermentation.

solution of the problem in the schools of philosophy ; reason avails us nothing, and we are therefore obliged to view its effects in silent admiration ; to regard it as an impulse from Divinity cast by the hand of God upon the organized part of the creation, alike astonishing and perfectly incomprehensible.

In the ascent from the vegetable to the animal kingdom, and from one rank of animal existence to another the most admirable order is manifest. The eye is not astonished by sudden steps, or encountered by violent changes, an evident connexion pervades the whole. And though there is a vast diversity when the meanest specimen of organic life is compared with its most perfect and majestic forms, yet between the two an harmonious chain may be traced, and the eye passes from one extreme to the other by a regular and hardly perceptible gradation. It will be necessary first to examine the Zoophytes, plant animals as their name implies, which raise up the coral islands. They may be described as aquatic animals, of a plant-like form, generally compound, and fixed by their base. They have a mouth surrounded by cilia for attracting their prey ; digestive organs, consisting of numerous small superficial sacks, but no very distinct traces of a nervous, muscular, or circulating system. The body for the most part is supported by an axis or skeleton composed of cartilaginous, horny, calcareous, or silicious substances. This fourth division of Cuvier, namely, that of the Zoophytes, says Professor Rymer Jones, "is confessedly made up of the most heterogeneous materials, comprising animals differing in too

many important points to allow of their being associated in the same group."

Succeeding Naturalists witnessing the success that attended Cuvier in selecting the evident relation which the perfection of the nervous system bears to that of the animal structure, as the great point of distinction in the establishment of the higher divisions of the animal kingdom, still tried to have recourse to this important part of the system, in making a further subdivision of the Radiata of Cuvier. In some few, traces of nervous filaments have been found. These have been classed together and called by Professor Owen the Nematoneura,* in contradistinction to the Acrita,† which appear to have no trace of a nervous system.

The common sponge of commerce consists of numerous small fibres made up of horny elastic bands closely connected to each other, and forming numerous canals. To this peculiarity of structure the sponge owes all its useful qualities; the fibres after compression returning to their former state, leaving the canals which they form open to suck up surrounding fluids. But the sponge commonly employed is only the dry bones or skeleton of the living animal. Before it is dragged from its native seas, it is completely surrounded with a thin semi-fluid coating resembling glue, composed of aggregated transparent globules which were the living part of the sponge, secreting as it extended itself the

* *Nῆμα*, a thread; *Νευρον*, a nerve.

† A priv. *κρίνω*, to discern.

horny fibres which are imbedded in it. Doctor Grant observed on placing a living sponge in a glass filled with sea-water, something like a vital action commencing.* The entire surface was studded with countless perforations varying in size ; through the smaller of which the water was constantly sucked into the interior of the sponge, again discharging it after some little time had elapsed by the larger openings." It is through these openings that the germs which in time form other sponges are at certain seasons discharged. The parent sponge is composed of a mass similarly organized, so that if divided into numerous parts, each divided portion would become a distinct and perfect animal. But the parent is deprived of all power of motion ; the dispersion of the species cannot be effected as in the case of the seeds of plants which are blown about by the wind ; the still waters in which sponges grow will not serve this purpose. Nature, however, furnishes the offspring with cilia which prevent it from sinking to the bottom, propel it forward to a considerable distance, and then deposit it upon some rock to which it becomes fixed, and losing in the adult state the cilia with which it rowed itself to its present habitation, develops within its substance the skeleton peculiar to the species, and in time possessing the form of the individual from which it sprung, is fixed to one portion of the rock only, and remains incapable of motion.

* Philosophical Transactions.

When this curious family, the members of which are now termed Polyyps (which are the Zoophytes of old authors) are considered in relation to their form and structure, it is not surprising that they have been considered so long as belonging to the vegetable kingdom. Fixed in large arborescent masses to the rocks of tropical seas, or in our own climate attached to shells or other submarine substances, they throw out their ramifications in a thousand beautiful plant-like forms; or incrusting the rocks with a calcareous earth separated from the water by which they are covered, in silence build up the shoals so dangerous in the navigation of this part of the ocean; and sometimes, says Rymer Jones, give origin as they rise to the surface of the sea to islands which the lapse of ages cover with luxuriant verdure. Two familiar instances of this curious tribe may be given:—one in the calcareous structures of tropical seas, known under the name of corals, madrepores, &c. which are used as ornaments; another, found in this country, easily examined by any of us, the Hydræ or fresh water polyyps, which are common in such of our ponds as contain clear water, and may be observed floating upon their surface. The body is a simple tube filled with a gelatinous substance. One end of the tube is terminated with a minute sucker, at the other mouth is a number of delicate cilia. The most common is the *Hydra viridis*. The *Hydra fusca* are frequently met with; are larger, and can when placed under a powerful microscope be examined with ease. They live upon the larva of insects, and even fishes sometimes form a portion of their food. When

advancing to the surface they generally crawl along the stem of some aquatic plant at the rate of about one or two inches in an hour, but on reaching the top of the water suspending their body by the tail, they either row themselves (the mouth then being downwards) with their tentacles, or are wafted to a considerable distance by the wind.

It may be remarked, that the nervous system in man consists of a central organ, the cerebro-spinal centre or axis, and of numerous rounded and flattened white chords. The cerebro-spinal axis consists of two portions — the brain, an organ of very large size situated within the skull, and the spinal chord which is a lengthened portion of the nervous centre joined to, or rather continuous with the brain, and placed in the vertebral canal.

The centre of the nervous system in the lowest animals having a lengthened axis presents itself in the form of a double chord. Advancing a step higher in the scale of animal existence, little rounded bodies like peas (ganglia) are formed upon one extremity of this chord: such is the most rudimentary condition of the brain in the lowest forms of vertebrata. In the lower tribes of fishes the anterior extremity of the double chord displays a succession of five pairs of ganglia. The disposition of these ganglia appears to be different in the higher fishes and amphibia. The first two become blended into a single ganglion, and then there are only three pairs of symmetrical ganglia. If, however, they are hardened in alcohol, the five pairs are still found to exist, four having been concealed by a very thin covering that is spread over them. We have now

arrived at that portion of the discussion which carries us upwards in the animal scale even to Mammalia,* and a little additional investigation proves the important fact, that the brain among the lower animals consists of primitive chords ; primitive ganglia upon these chords, and commissures which connect the substances of the adjoining ganglia and associate their actions. In man the first indication of a spinal chord is presented in the form of minute longitudinal filaments placed side by side. Upon these, near the anterior extremity, five pairs of very minute swellings, not disposed in lines as in fishes, but curved so as to correspond with the future cranium, are formed. The posterior pair become joined at the centre, the second pair also unite, and the third and fourth pairs at first easily distinguished are soon concealed by a developement from each side ; the anterior pairs which are at first very small decrease in size, and become more and more concealed in the increasing growth of succeeding pairs.

INSECTA.

The numerous class of Insects has been divided and subdivided into numerous orders, the most important

* In the dog and cat is found first a single ganglion, the cerebellum ; then three pairs following each other. On separating the middle pair it is seen to be composed of two portions concealed by additional developement. Again the primitive ganglia of opposite sides are connected by transverse fibres of communication.

of which are described in the table at the commencement of the volume. It may, however, be necessary to select the following as the best calculated to make the reader acquainted with the subject:—

I. INSECTA AMETABOLA. The larva resembles the perfect insect, but has no wings.

ORDER I.—Hemiptera (*ἡμισυς*, half; *πτερον*, a wing.) When present we have in this order four wings; the anterior or upper pair are coriaceous in their structure for one half of their extent, while the other portion is membranous. Hence the name.

ORDER II.—Orthoptera (*ὀρθός*, straight; *πτερον*). The perfect insect has four wings, the posterior pair being the largest, which are folded when at rest.

ORDER III.—Dictyoptera (*δικτυωτός*, reticulated; *πτερον*).—This order includes the cock-roaches, in which the wings are four in number.

II. INSECTA METABOLA. The larva is a worm; the pupa does not eat or move.

ORDER IV.—Neuroptera (*νευρον*, a nerve; *πτερον*). Insects with four wings of equal size, with reticulated nerves and strong lateral jaws. The most perfect example is furnished in the dragon flies (*Libellula*) the largest of our insect tribes famed for their tyranny and carnivorous appetite.

ORDER V.—Diptera (*διπτερος*, *δισ*, *πτερον*) with two wings. As the common house fly.

ORDER VI.—Lepidoptera (*λεπίς*, a scale; *πτερόν*). The insects belonging to this order have four wings covered with scales; the larvæ have feet and a distinct head, as the butterfly race.

ORDER VII.—Hymenoptera (*ὄμην-ενος*; *πτερόν*). These insects have four naked wings. Larvæ generally without head or feet, sometimes with both. Wasps, bees, &c.

ORDER VIII.—Coleoptera. In this order the anterior wings are converted into a dense horny case or elytra, beneath which the posterior wings of flight are folded up. This order includes the beetles, as the common cockchaffer (*Melolontha*).

In the midst of the exuberent vegetation of the torrid zone, the largest and most splendid of the insect tribes are to be seen. The butterflies of Africa, of the East Indies and America, are adorned with the most brilliant colours; and in the tropical forests, especially of South America, millions of shining flies present during the night the appearance of an extensive conflagration. In these countries some races of insects exist in such multitudes, and are armed with such destructive or venomous qualities, as to enable them to lay waste the fruits of the earth throughout large tracts of country, or to become a source of the most serious personal discomfort to man. The white ants (*Termites*) raise lofty hillocks, and where they abound have been known to excavate the soil to such a degree as to endanger the safety of houses which happened to stand above the seat of their operations. They devour paper and parchment so rapidly, that Humboldt mentions the curious fact that whole provinces of Spanish America cannot furnish a single document dated one hundred

years ago. The mosquitoes and other members of the same family (Tipulæ) are also formidable enemies to the human race in these climates. Amid the extensive forests of South America, especially along the banks of particular rivers, there are found large tracts almost uninhabitable, owing to the thick swarms of these insects, and the increasing torment which they occasion. The lower strata of air to the height of nearly twenty feet from the ground are sometimes so filled with them as to give the appearance of a condensed vapour. During the day the atmosphere teems with the mosquitoes, which are small venomous flies; these are succeeded at night by a species of gnat (quancudoes). The distribution of these insects is very remarkable, and frequently depends upon local circumstances which cannot be explained. They are in general found to shun those rivers which have what the Spaniards call black waters (aguas negras), and also dry and unwooded spots. They swarm most upon the banks of rivers, and nearly disappear where the elevation of the ground exceeds two or three thousand feet above the level of the sea. The annoyance occasioned by insects of this description is not confined to the torrid zone, for even in the Arctic regions of Greenland and Lapland the short summer gives birth to various species of gnats.

PISCES.

Fishes are divided into two great sections, the OSSEI and CHONDROPTERYGII. In the former the skeleton is formed of true bone, while in the latter it

always remains in a state of cartilage or gristle. The former is divided into six, the latter into two orders.

CUVIER'S DIVISION OF FISHES.

CLASS.	SERIES.	ORDER.	EXAMPLES OF SPECIES.
PISCES.	I. OSSEI Bony fishes.	1. Acanthopterygii	{ As the perch, mackerel, and many others; even three-fourths of the fishes known.
		2. Malacopterygii abdominales .	{ Ventral fins far behind the pectorals; contains five families. Salmon, trout, carp, &c. &c.
		3. Malacopterygii subbrachii . .	{ Ventral fins placed close under the pectorals; contains three families. Cod, whiting, &c. &c.
		4. Malacopterygii apodes . . .	{ No ventral fins. Conger eel, electric eel, &c.
		5. Lophobranchii (gills tufted) .	{ Contains two genera. Pipe-fish, &c.
		6. Plectognathi .	{ Scales in the form of Mosaic work. Sun-fish, trunk-fish.
	II. CHONDROPTERYGII Cartilaginous fishes.	7. Eleutherobranchii (gills free)	{ The sturgeon belongs to this order.
		8. Pectobranchii (gills confined.)	{ Contains the shark, torpedo, blind lamprey, &c. The shark belongs to the genus Squabus, the torpedo to the Raia.

It is probable that every basin of the ocean has its peculiar tribes, while indeed the regions which some inhabit are well known. Thus the cod (*Gadus Moorhua*) which are distributed over all the northern seas of Europe, congregate chiefly upon the great sand bank to the south of Newfoundland.

The largest and most powerful of those fish which possess electrical properties also live within the torrid zone. The Mediterranean contains four species of electrical torpedoes,* but the shocks which they communicate cannot be compared in violence to those of the gymnoti,† which inhabit the rivers and stagnant pools of South America. It is related that some years ago it became necessary to change the direction of a road from Urituca, in consequence of the number of mules of burden lost in fording a river in which large quantities of these creatures were found. The temperature of the water in which they habitually live is from 78° to 80°, their electric force is said to diminish in proportion to the decrease in the heat of the water. The seas of the warmer regions contain the shark (*Squalus maximus*), of which there are several varieties, all distinguished however for their extreme ferocity; but the most enormous in size are the whale tribes,‡ which belong more particularly to the high latitudes.

* *Torpedo Galvanii*.

† *Gymnotus Electricus*. In the rivers of Africa another fish is found also possessing this property.

‡ Common whale. *Balæna Mysticetus*.

It is a well known fact, that in every portion of the animal world the lowest tribes are inhabitants of water. To exist on the land requires a more perfect organization, a greater intelligence, a considerable share of strength and activity. This is the case with regard to fishes. Inhabitants of a dense element, easily supported at any altitude, but feeble limbs are required to guide their path along the deep. It is concluded also that their senses are but imperfect. The sense of tact and touch cannot be perfect in an animal clothed in an armour of scales. Can taste exist? If so, how blunted in creatures feeding in the manner they do. Floating in an element often dense and muddy, through which the light can scarcely dart one noon-tide ray, the power of sight is of necessity feeble. Dwellers in the realms of eternal silence; entombed in the unfathomable depths of the ocean, whereunto no sound can penetrate—the voice of the storm find no echo; the sense of hearing is but little needed. Nor can the sense of smell be very acute; and yet they live, they row themselves along the stream, they are calculated to enjoy life, and to suffer pain. Why are they happy? Simply because they have been so formed by the Creator as best to fill the station they are called upon to occupy.

The migration of fishes appears to be occasioned by their seeking shallow water in order to deposit their spawn. The herrings (*Clupea Harengus*) which are supposed to come from the bottom of the Arctic Ocean, proceed every year to the coasts of the British islands, Norway, Denmark, Sweden, and the United States. The opinion is that their innumerable shoals follow the

direction of the chains of submarine banks and rocks, which they meet with in their progress. Tunnies also migrate from the Atlantic Ocean to the Mediterranean.

REPTILIA.

Before describing Reptiles, it may be necessary to remark that although the globe is said to be composed of land and water, a slight investigation proves that there is in addition extensive marshes, little adapted for the abode of aquatic or terrestrial animals. These portions of our planet are alternately wet and dry, and are therefore provided with a stock of animals capable of existing either on land or water, called the Amphibia (Batrachia of Cuvier), which are to the anatomist among the most interesting in the whole range of zoology. Aquatic animals properly so called breathe by means of gills; for a vertebrate animal to breathe it must be provided with lungs. If first to live in the air, and then in the water, is the mode of life destined for the animal, it must be provided both with gills and lungs, which can be used as occasion may require. A peculiar plan is adopted with the lowest reptiles: by means of branchiæ they respire like fishes in the water; leaving the water they breathe by the lungs with which they are provided, and this compound organization enables them to exist in an aerial, or aquatic element, combining as they do the necessary condition for residing in either medium.

The hot regions of the globe, and more particularly America, contain the largest and most formidable of

the class Reptilia. Reptiles are divided into four natural orders, named the Chelonia, or tortoise tribe; the Sauria, or lizard; the Ophidia, or serpent; and the Batrachia, or frog tribe. The frog kind are remarkable for presenting in early life a different formation from that which they assume when adult. Thus it is generally known that the young tadpole breathes by gills, and in some genera of this order the gills are never lost. An easy transition is thus formed from the class of reptiles to that of fishes. In the hot regions of the globe is found the rattle-snake (*Crotalus Horridus*) and the boa-constrictor; the former, with numerous others, distinguished for the deadly poison with which they are armed; the latter for the power it possesses of destroying the largest quadrupeds by the force it exerts in coiling around their bodies.

Here also the lizard race, under the various titles of crocodiles,* gavials,† alligators‡ and caymen, attain to an immense growth. The largest is the crocodile of the river Nile, which when full grown has been found to measure nearly thirty feet in length. It is worthy of remark, that the dry season near the equator has the same effect upon several of the reptile race as the cold of northern countries. In South America, when the swelling of the rivers subsides, and the surface becomes parched by the heat of the sun, boas and crocodiles

* *Lacerta Crocodilus*.

† *Lacerta Gangetica*.

‡ *Crocodilus Sclerops*. This is the spectacled cayman or alligator of Cuvier.

bury themselves beneath the mud, and await in a state of lethargy the periodical rains. Advancing into the higher latitudes, reptiles are found to diminish both in number and magnitude, and even the worst of them become comparatively harmless. Before leaving the class Reptilia, it ought to be remarked that the third order (Ophidia) is primarily divided into three classes: 1. Snakes (Angues); 2. true serpents; and 3. naked serpents. The first and third contain all but one genus. The second contains all the rest; but as they vary in many respects, these reptiles are again subdivided into two tribes, 1. The double-marcheurs, possessing the power of moving with either end of their bodies foremost; 2. The serpents proper, who advance only with the head foremost. The serpents proper are again divided into venomous and non-venomous; the venomous, are classed according to their teeth; as they have isolated fangs, or fangs accompanied with the ordinary teeth of the jaw. An example may be given of each. NON-VENOMOUS: *Anguis fragilis*, or common blind worm. VENOMOUS: *Coluber Naia*, or *Cobra di Capello*, and the *Coluber Berus*, or common viper. Two familiar examples of the fourth order (Batrachia), are furnished in the common frog, *Rana Temporaria*, and the common toad, *Rana Bufo*.

A V E S.

Continuing the simple and beautiful classification of Cuvier, the next link in the chain of animal life is supplied by birds. He takes two leading character-

istics; first the formation of the feet, and secondly the peculiarities of the bill. The following table will at once explain this class, which comprises six orders:—

CLASS.	ORDER.
AVES.	I. Accipitres Birds of prey.
	II. Passeres Sparrow kind.
	III. Scansores Climbers.
	IV. Gallinacea Poultry kind.
	V. Grallæ Waders.
	VI. Palmipedes Web-footed.

The birds of prey are divided into diurnal and nocturnal, the former including the two great genera of Linnæus, Vultures and Falcons; the latter his genus of Owls. Or this division may be taken, *Raptores*, birds of prey; *Insessores*, or perching birds; *Rasores*, or gallinaceous birds; *Grallatores*, waders; and *Natatores*, swimming birds:—but this classification is inferior to the one just given. With respect to birds, it might at first be supposed, from the powers of locomotion with which they are gifted, that the existence of each species is not limited to a single region, and it is true that some of them, including several of the vulture tribe, spread themselves almost over the whole world. But it appears particular kinds are generally confined to a very small range, especially such as have heavy bodies and weak powers of flight. Even the condor,* which frequently soars at an elevation of four miles,

* Sarcorhamphus Gryphus.

never forsakes the chain of the Cordilleras of Peru and Mexico, and the great eagle does not quit the ridges of the Alps. The Torrid Zone possesses a variety of the most beautiful birds, including the humming bird,* the cockatoo,† the bird of paradise‡ and several other species of the parrot tribe. Parrots|| in the New World are found as far north as the 35°. Of the birds which cannot fly, each equatorial region isolated by the ocean has its own varieties. The Ostrich§ of Africa and Arabia; the cassowary¶ of Java and of New Holland, and the Brazilian ostrich, are distinct species, possessing a general similarity of organization.

The Frozen Zone too has its peculiar feathered tribes, including the *Strix Laponicus* (Lapland owl), and the *Anas Mollissima* (eider duck). The *Anas Mollissima* frequents the shores of the Arctic Seas, and from their nests the eider down is obtained. This species is classed under the fifth order (*Palmipedes*), which contains such birds as are web-footed, and fitted for an aquatic life. The order is divided into four natural families, 1. *Brachyptera* (divers); 2. *Longipennes* (high flying birds); 3. the *Tottipalmes*, in which the thumb, as well as the other toes, is included in the common web of the foot; 4. the *Hamellirostres*, which

* Vide Order II. Passeres.

† *Psittacus Gigas*. Black cockatoo.

‡ *Paradisca Apoda*.

|| Vide Order III. Sansores.

§ *Struthio Camelus*.

¶ *Struthio Casuarius*.

have bills furnished with rows of laminae resembling fine teeth. The great genus *Anas* is divided primarily into three sub-genera, Swans, Geese, and Ducks. The Swans form one sub-genus; the Geese and the Ducks so many, that the limits of this work forbid their description. The last sub-genus (*Tadoma*) is also subdivided; containing the Muscovy duck, the teal, the mallard, and many others.

The several kinds of sea-birds do not wander beyond certain limits, which are as it were assigned to each. Thus the *Diomedea exulans*, (wandering Albatross, or man-of-war bird,) is seen flitting along the surface of the waves on approaching the 40' p. of latitude. The sea swallows and the various tropical birds keep within the Torrid Zone.

The migration of birds from one country to another in consequence of the change in the seasons is a very remarkable circumstance. The direction and extent of these migrations are still in most cases but very imperfectly known. On the approach of winter the swallows, storks, cranes, and other migratory birds, abandon the northern climates of Europe, for the warmer sunshine of the south. In the equinoctial regions the variations of drought and humidity appear to influence the habits of animals in the same manner as the great change of temperature in our climate.

QUADRUPEDS.

Quadrupeds are an order of animals more perfectly organized than any of those yet considered; never-

theless as they are in many instances closely connected with man and come more immediately under his observation, their distribution can be traced with greater ease. The hot regions towards the equator furnish this order in the utmost variety and number, and many of the tribes existing there are distinguished for their size, strength, and ferocity of disposition. The Lion (*Felis Leo*), the Tiger, the Hyena, and the Leopard; the Elephant, the Rhinoceros, the Hippopotamus, the Giraffe (*Camelopardalis Girafa*), are all inhabitants of the Torrid Zone and its vicinity. The giraffe is fond of a wooded country. The leaves of trees are its principal food. One killed by Arabs measured twenty-one French feet in height from the ears to the hoofs. It feeds with great delicacy and takes its food leaf by leaf, which it collects by means of its long tongue drawing down the branches with this organ. It rejects the thorns, and in this respect differs from the camel. Independently of its long neck, which forms a singular feature in the giraffe, there are many points in its structure well deserving attention. The eyes are large, soft, and bright, fringed with long dark lashes; their prominent and lateral situation enables them to survey the desert on every side with the greatest ease. The tongue is long and cylindrical, capable of great extension, and of singular flexibility. It in fact is made to serve as a hand in drawing down the twigs and leaves of the trees upon which it feeds. The lips are thin and delicate, and the nostrils are oblique apertures capable of being closed at pleasure. The horns are short, covered with skin, and crowned by a tuft of long hair. The above animals exhibit distinctive marks of

the three following tribes, 1. Carnassier, divided into three great families, Chiroptera, Insectivora, and Carnivora.* 2. The Pachydermata, also divided into three tribes; the Proboscidea, or those furnished with a proboscis, including the elephant, and some fossil animals. 2. The common Pachydermata, including all the rest of the order except the horse (equus caballus), which belongs to the third family Solipeda, or solid-footed. 3. The Ruminantia, again subdivided into two great classes. To the first belong the camel and musk, to the second all the other genera. Horns are of three kinds, specimens of which may be seen in the *deciduous* antler of the stag, the permanent investing protuberances of the cameleopard, and the true horn, or perfect, hollow, corneous case of the cow, sheep, and antelope. These peculiarities suggested to Colonel Hamilton Smith a division of the whole order into several tribes, the types of which may be presented in the stag, giraffe, goat, and ox.

In the more temperate regions of the earth the animals are of much smaller dimensions; and the only beasts of prey are the bear, lynx, and wild-boar, but the domestic tribes are there reared in the greatest possible perfection. The white or Polar bear,† which is quite different from the common bear, and much more

* Chiroptera includes the bat tribe. Insectivora the common hedgehog (*Erinaceus Europæus*). Carnivora the dog, the pole cat, &c. &c. &c.

† *Ursus Maritimus*.

formidable, inhabits the coasts of the Arctic Ocean, so that under both extremes of temperature the animal creation assumes an excessive degree of ferocity.

The domestic animals have been conveyed by man to various parts of the world, and are therefore very widely dispersed. Under this title must be included, the dog, the cow, the horse, ass, sheep, and pig — not forgetting the cat. The ass is not so capable of bearing cold as some other of the domesticated races. When beheld in the northern parts of Europe he is quite a degenerated animal. South of the 40 P. of latitude, under the influence of a warmer climate and better treatment, he is larger, more lively and docile. The horse, originally a native of the central parts of the old continent, is now spread from the confines of the Arctic Circle to beyond the 50 degree of southern latitude. He exists as high as Norway and Iceland, where the race becomes small and of a peculiar variety. It is found even extending into the desolate regions of Patagonia.* This animal was introduced into South America by the Spaniards in their early visits to that continent; it has since greatly increased, and extensive herds are to be found wandering over the plains. The existence of these animals is exposed to the most severe sufferings. In the rainy season, the horses that wander in the Savannah and have not time to reach the rising ground, perish by hundreds in the waters. The mares may be

* Patagonia is situate in the most southern part of South America, and is inhabited by a race of men famed for their gigantic stature.

seen following their foals swimming during a portion of the day to feed upon the tops of the herbs which are alone above the rivers. In this state they are pursued by the crocodiles; and it is not uncommon to find the prints of the teeth of these carnivorous reptiles on various parts of their bodies. The effects of these inundations cannot be examined without admiring the prodigious pliability of the animals which man has subjected to his sway. In Greenland the dog feeds upon the refuse of the fisheries, when fish cannot be procured sea-weed forms his food. The ass and the horse, originally natives of the cold and barren plains of Upper Asia, follow man to the New World; return to the savage state, and lead a restless and painful life in the burning climates of the tropics. Pressed alternately by drought and humidity, they sometimes seek a pool in the midst of a bare and dusty soil to quench their thirst; at other times flee from the overflowing of the rivers as from a powerful enemy. When the weather is unusually dry, the mules feed upon the thorny melocactus, which not only supplies them with food, but also quenches their thirst by its milky juice: it is in truth the fountain of the wilderness, or spring which, never dry, continues to supply them with the means of preserving life and alleviating their sufferings. During the rainy season these animals lead a kind of amphibious life surrounded by crocodiles and water serpents; still such are the immutable laws of nature that their races are preserved in their struggles with the elements, and amid so many sufferings and dangers. When the waters retire and the rivers return into their beds, the plains are covered with fine odoriferous

grass, and the animals of Europe and Upper Asia appear to enjoy, as in their own climate, the renewed vegetation of spring.

It has been remarked by Buffon, that the largest quadrupeds, such as the elephant, rhinoceros, and camelopard, as well as the camel and most of the ox kind, are inhabitants of the Old World. In America the fossil remains of some large animals have been discovered, but of living species few remain of any considerable size. It is also remarked that the Old World contains also the animals which are distinguished as the most powerful and most perfect in their structure; those of the New having for the most part a character of organization which assigns them a lower rank in the scale of animated beings. Such carnivorous animals as are distinguished for their courage, among which are the lion, the tiger, and the hyena, are confined to Asia and Africa. The American tribes which approach nearest to these are in general much more feeble than the African and Asiatic species. It may also be added that the most swift, as well as the most beautiful and graceful of quadrupeds, chiefly belong to the old continent, whilst the kinds which are most useful to man, including the goat, the horse, the ox, and the ass, were unknown in America till their introduction into that country by the Spaniards.

Confining these remarks for the present to wild animals, the earth may be divided into a number of zoological regions, or provinces, each of which is the residence of a distinct set of quadrupeds. The first of such provinces commencing from the north is the Arctic region which contains the rein deer (*Cervus*

Tarandus), the white bear, the Arctic fox, and other tribes common to both the great continents. The circumstance of their being common to both may be traced to the communication formed by the ice during winter.

The *Northern Temperate Zone* is divided by the ocean into two great districts. The same tribes are found to be spread from the western to the eastern parts of the old continent; but the quadrupeds which inhabit the temperate climate of America are peculiar races.

The *Equatorial Region* contains three extensive tracts widely separated from each other by the sea. These are the intertropical parts of Africa and America and of continental India: each of the three tracts in question has a distinct nation of quadrupeds. The Indian Isles, particularly the Sunda and Molucca islands, may also be considered as a separate region.

Beyond the *Indian Archipelago* is Papua, under which name it is usual to include New Guinea, New Britain, and New Ireland. These countries which are formed by a continuation of their mountain chains, namely, the Archipelago of Solomon's Islands, Louisiade, and the New Hebrides, with the more remote groups in the great southern ocean, may be regarded as one zoological province. It is remarked that all this extensive region appears to be destitute of native warm-blooded animals, except a few kinds of bats and some small domestic animals in the possession of the natives.

The large regions of *Australia* form another zoological province in which are contained many indigenous

tribes of a very singular description ; lastly, the *southern extremities of America and Africa* are each distinguished as the abode of particular species.

Of the several provinces into which the animal world admits of division, none are peopled with so remarkable a stock of animals as Australia, including under that designation New Holland and the adjacent islands to the southward. It possesses several entire genera of quadrupeds which have been discovered in no other part of the world, and it is further deserving of notice, that most of the tribes peculiar to New Holland, though on the whole very dissimilar to each other, have some striking characters of organization common to all. It was assumed by Linnæus, that the great class of warm-blooded animals (quadrupeds) were without exception either viviparous or mammiferous ; the first of which denotes the production of their offspring in a living state, and the second their being supplied with organs for suckling their young. On this account it has received the name of Mammalia.* In

* Linnæus, like Aristotle, the father of our art, selected the circulating system as the foundation of his arrangement, dividing the Animal Kingdom into three sections.

I. Animals possessed of warm red blood, and provided with a heart divided into four cavities ; two auricles, and two ventricles ; as the mammalia and birds.

II. Animals with red cold blood, possessed of but one auricle and one ventricle, as he supposed the case in reptiles and fishes.

III. Animals possessed of cold white sanies instead of blood ; having a heart containing but a single cavity, which he supposed to be an auricle. Under this division he includes insects, and other invertebrate animals ; the latter he calls vermes.

New Holland, however, a tribe of warm-blooded animals has been discovered, to which the term is not applicable, because they are *oviparous* (that is, produce eggs), and are therefore unprovided with the organs above mentioned. Another remarkable tribe is the Marsupial, which term comprises such animals as produce their young in an immature state, and keep them for a time attached to their bodies in bags or pouches provided by nature for that purpose. This tribe is also for the most part confined to New Holland. One genus of it indeed, the *Didelphis* or opossum, is found in South America, but over the Australian regions there are distributed several genera of the order Marsupiatæ, comprehending more than forty species, including the kangaroo rat (*Macropus Minor*), and the kangaroo (*Macropus Major*), and also the *Dysurus*, or Australian opossum.

The American differs from the Australian opossum in several respects, one of which is the having a long prehensile or muscular tail, which serves as a fifth limb, and is of very great use to animals inhabiting extensive and lofty forests. In the same portion of America there are other animals resembling the *Didelphis* in this respect: these are a numerous tribe of monkeys* (*Sapajous*), the ant-eater, and the *Hystrix Prehensilis*, or prehensile porcupine, and the *Kinkajous*. It is impossible to consider these facts without ob-

* The first eight sub-genera of monkeys (*Simiæ*) inhabit the Old World; the remainder belong to the New, and have received the general appellation of *Sapajous*.





Simia seniculus.

(Red Howling Monkey)



servicing striking instances of the structure of animals being fitted to the nature of the country in which they reside. The monkeys of Africa and of India are distinguished by no such peculiarity, for in these portions of the world it is not requisite. And here I cannot fail to remind you, that the study of Natural History, both as regards the higher and lower tribes of animate beings, tends to exercise the intellect step by step as we proceed in tracing the connexion between natural causes and their consequences, and to expand and elevate the mind to the noblest of all contemplations, the wisdom and beneficence of Deity.

" I cannot go,
Where universal love smiles not around,
Sustaining all yon orbs and all their suns ;
From seeming evil still educing good,
And better thence again, a better still
In infinite progression."

It has already been mentioned, that the new continent, as compared with the old, is nearly destitute of the most powerful and perfect tribes of quadrupeds. In their place are found most of those singular races in the formation of which the ordinary rules of nature seem most widely to have been relinquished. Such are the tribes which Cuvier has denominated *Edentes*, or quadrupeds defective with respect to teeth ; some of them being entirely destitute of those organs. Thus America contains the whole family of the ant-eaters (*Mgymecophaga*), which are quite unprovided with teeth ; and the armadilloes (*Dasyppus*), which have grinding but no cutting teeth.

That part of southern Africa which extends from the Tropic of Capricorn forms quite a distinct zoological province; separated as it is by the intervention of the torrid zone from the milder climates north of the equator. Accordingly the animal creation assumes a character almost as peculiar as that which is displayed by the vegetable. Of the order *Mammalia* southern Africa contains several peculiar genera which occupy various distances towards the north, according to the degree in which they are capable of bearing a hot climate. In many instances the same genera are found in this region that exist in the temperate countries north of the equator, but it is to be remarked that the southern species differ from the northern.

From the southern tropic to the Cape of Good Hope the continent of Africa stretches into fine level lands, over which swarm a great diversity of hoofed quadrupeds. Beside five of the horse genus, there are also peculiar species of the rhinoceros and hog; and among ruminating animals, the giraffe, the Cape buffalo, and several remarkable antelopes.

It will be proper in the next place to inquire more particularly into the manner in which the numerous families of quadrupeds are distributed over different parts of the world. In this enumeration it is of course not intended to include the animals which man has been the means of conveying from one country to another, where the same species have in some instances been scattered over the most distant parts of the earth. Most of the animals which Linnæus classed in his order *primates*, inhabit warm or temperate climates. The two grand divisions of this order are the bat and

monkey tribes. The latter has been subdivided by Cuvier into two chief branches very different from each other—the Simiæ proper, which are confined to the old continent, and the Sapajous, which are peculiar to America. The African Simiæ are distinguished from the Indian, and most of their species are confined to a comparatively small tract. Thus the negro monkey (*Scmnopithecus Maura*) inhabits India, the *Semnopithecus Sinica* belongs to China, and the little baboon (*Semnopithecus Cynocephalus*) is only found in Africa. In the island of Madagascar no true Simiæ exist, but a tribe of Lemurs is found, including the Lemur Catta, or ring-tailed lemur. Of the bat* tribe, the Rousettes or fruit-eating bats inhabit the Indian Archipelago, and the vampires (blood-suckers), nine species of which have been described, are all peculiar to America. The Vespertiones are the most numerous family of bats and are widely spread, but this is not the case with the majority. One species of bat is common both to the old and new continent.

The carnivorous animals (properly so called) are extensively spread, although most of them belong to hot climates. Of the twenty-eight species of the cat kind that are enumerated not one is common to America and the old continent. The tiger is found only in Asia extending as far as Chinese Tartary; but is far the most common in India living among the ravines

* Frungiferous: *Pteropus Edulis*, black rousette. Blood-sucking: *Vespertilio Spectrum*, spectre or true vampire bat.

and jungles. Africa, though destitute of tigers, possesses panthers and leopards. The lion is most formidable in Africa where we find two species, the Barbary and the Senegal. He is also said to live in those parts of Arabia and Persia which border on the Tigris and Euphrates, from the Persian Gulf as far as Bagdad. The Arabian species are described as much smaller, and the males have no mane. Some of the dog kind are also found to require a warm climate occupying a limited space either in Asia, Africa, or America. Others live in colder regions. The dog of the Faulkland Islands (*Canis Antarcticus*), is the only quadruped which has been discovered there. This dog has been considered by some as a distinct species, but is now supposed to be the same that inhabits Chili, although naturalists are at present divided in their opinions on this point.

The thick-skinned tribes live only in warm or temperate regions. There exist two species of elephant, the Indian and the African. Of the rhinoceros there are several kinds, but none are possessed in common by Asia and Africa. Those with *two horns* inhabit South Africa, those with one horn belong to India and China and some of the islands of the Indian Archipelago. The Indian rhinoceros* was first introduced into this country in 1513. A second was transported to England in 1685, and four others arrived in Europe in 1685. A very large one died after a residence of

* *Rhinoceros Indicus* of Cuvier. *R. Unicornis* of Linnæus.

twenty-two years at Versailles, and a very fine animal is now in London belonging to the Zoological Society introduced by them in 1834. In America the only representative of these large pachydermatous animals is the *Tapir Americanus*. The Hyrax (badger) and hog tribes do not extend into very cold climates; the wild boar, ranging further north than any of his tribe, is spread over various parts of Europe, but is never seen northward of the Baltic. The domestic hog, since its introduction into America, has much increased, forming large herds.

Among ruminating animals, the goat, the antelope, and the giraffe, are found only in the old continent, but America possesses some curious species of sheep, as for example, the Pace, which in its domestic state is called Bicornua or Vigonia, and is an inhabitant of Peru also. The giraffe, which has already been described as remarkable for its height, swan-like neck, harmless and gentle disposition and other peculiarities, is a native of southern Africa. The numerous species of antelope* are almost confined to Asia and Africa. The dromedary, or camel with one hump, is a native both of Africa and Asia; the two humped or Bactrian camel, so called because it is supposed to have come from Bactriana, belongs to much more northern climates than the other, living in central Asia and in countries where the winter is very severe. Little can be said in addition, of the distribution of quadrupeds on certain

* Antelope Dorcas or Gazelle.

islands. Small islands placed at a great distance from continents are in general quite destitute of land quadrupeds, except such as appear to have been conveyed to them by man. The animals belonging to islands situated in the neighbourhood of continents are generally the same as the adjacent main-lands. There is then sufficient reason for supposing that islands in general derived their quadrupeds from the continents near to which they are placed.

CHAPTER III.



MANNER IN WHICH THE EARTH WAS FIRST
PEOPLED WITH ANIMALS.

“ Vast chain of being which from God began,
Nature's ethereal, human, angel, man,—
Beast, bird, fish, insect : what no eye can see,
No glass can reach, from infinite to thee,
From thee to nothing.”

POPE'S ESSAY ON MAN.

HAVING now investigated at considerable length the circumstances which relate to the principal races of animals, it remains only to inquire what inferences can be drawn concerning the manner of their original dispersion over the earth ; whether that dispersion took place from a single spot, or whether, as is supposed was the case in the vegetable kingdom, it commenced from a variety of distinct centres.

The local existence of insects is so closely connected with that of the plants, which not only yield them sustenance, but in many instances supply their only place of abode, that we at once expect to find the same laws prevailing in the dispersion of this part of

the animal kingdom as in that of the vegetable tribes. This conjecture has been confirmed by the laborious researches of Latrulle, who states that the whole or a greater part of the Arachnides and other insects which have been brought from the western parts of Asia under whatever latitude, are distinct from those of Europe and of Africa. It also appears that with insects as with plants, where the species are different the genera are nevertheless often the same, and in this manner the Entomology of America approximates to that of the Australian countries and the east of Asia.

In adverting to the dispersion of the various tribes which inhabit the waters of the ocean, including the marine Mammalia, it is to be remarked that great vagueness and inaccuracy have long prevailed in the descriptions that have been given. This will sufficiently account for this department of the animal kingdom being declared to contain so many species which are said to inhabit indiscriminately all parts of the ocean. The common whale (*Balæna Mysticetus*) has been supposed to belong to the frozen seas of Spitzbergen and the Antarctic Circle. The sea calf (*Phoca Vitulena*), is reported by several writers to be an inhabitant not only of both circumpolar regions, but also of the seas of the Torrid Zone. The celebrated naturalist Peron, who personally collected and examined a large number of marine species in the southern hemisphere, has come to the conclusion that the Arctic Ocean does not contain one tribe well known and defined, which is not specifically distinct from those animals most analogous to it in the Antarctic seas. This remark applies not only to the

whale tribe and seals, but also to the lower marine animals, carrying us downwards through a variety of worms and mollusca even to the shapeless sponges of the ocean. It is also the same with the numerous Testacea* which gem the shores of the southern seas. The shores of Timor† present a great multitude of beautiful Testacea, but not one of these extends so far as the southern coast of New Holland.

With respect to reptiles, birds, and quadrupeds, the facts already stated concerning their distribution are sufficient to prove that different regions of the world are each in the possession of peculiar kinds. Many entire genera are wholly confined to certain districts, but when, as it frequently happens, the same genus is discovered among the wild and native animals of two distinct regions, between which natural obstacles have rendered a communication impossible, it will be found that it is not the same species that inhabit both countries, but corresponding species of the same genus. Thus the American species of the cat kind differ from the African and the Asiatic, and the species of horse, ox, antelope, rhinoceros, and elephant of Africa, are distinct from those of the same genera in Asia.

Both space and inclination are wanting to examine

* ACEPHALA. In this class there is no apparent head; the principal ganglion of the brain is placed over the mouth, which is placed at the bottom or between the folds of the mantle. In the first order (*Acephala Testacea*), the animals have four branchial leaflets. All the bivalves and many multivalves belong to it.

† Timor, an island in the Indian Ocean, lat. 10° S.

the numerous theories from time to time advanced to explain the manner in which each portion of the world was supplied with the animals now found. Linnæus, for example, supposed the habitable portion of the earth at first to consist of one region in which was a lofty range of mountains, from the base to the summit of which could be found all the climates of the Torrid, Temperate, and Frigid Zone; and that in it were congregated the originals of all animals and plants, together with our first parents. This is a very beautiful theory, in harmony with the word of God, and entitled to respect; but admitting that all animals and plants were so congregated in the Garden of Eden, there are no facts to prove their non-existence in other parts of the world at the same time.

Another writer contends "that living creatures originated in many different foci, these being the spots first left dry after the subsidence of the waters." The dispersion of plants may be accounted for in a variety of ways.* They may be carried onwards by the wind,

* An early volume (the fourth) of Brande's 'Quarterly Journal of Science' contains an interesting article, by M. Mirbel, upon the modes in which the spontaneous dissemination of plants is accomplished: a few remarks upon this subject, taken from that paper, and from other sources, will probably prove interesting.

The beautiful processes going on within the floral envelope of a plant for the maturation of its seeds would often seem objectless, unless adequate means for their dispersion existed. That this is effected, the constant and regular re-appearance of the countless races of the vegetable world attest; but since spontaneous move-

or borne along the stream, or becoming entangled in the hair or wool of animals conveyed to a considerable distance. There is, however, another way in which the

ments have been denied to plants, and man's immediate agency is but very limited, other causes of extensive operation must exist. Of these one of the most prominent is the wonderful fecundity of plants. Ray counted 32,000 seeds in the heads of one poppy-plant, and 360,000 on one tobacco-plant. Dodort mentions an elm which produced 529,000 seeds. Yet none of these vegetables are among the foremost in degree of fecundity. The number of seeds borne by a plant of Begonia or Vanilla, but above all by a fern, confounds calculation. But, 'as Linnaeus observes, supposing any annual plant produced only two seeds yearly, even of this, after twenty years, there would be 1,048,576 individuals. The great longevity of many seeds tends to the same end, for although some descriptions soon spoil, and hence require to be sown as soon as ripe, the greater proportion will preserve the germinating faculty for years, and even for ages. Professor Lindley observes that this would seem chiefly to depend on the degree of protection the integuments of the seed afford it; for, as gardeners well know, it is impossible to preserve very delicate seeds with thin skins more than a few weeks or months, so, on the other hand, hard horny seeds will germinate after the lapse of a very long portion of time. "When land is cleared, or ancient ditches emptied, or earth broken up to a considerable depth, as in well-digging, it not unfrequently happens that plants spring from the mould, whose seeds must have been buried for many years or ages." Horne sowed with success barley that had been gathered a hundred and fifty years. Wheat has been discovered in subterraneous hoards, which had been lost and forgotten for time out of mind, in as perfect a state as the day it was reaped. Melon seeds have grown after forty-one years, Indian wheat after thirty years, rye after forty years, sensitive

vegetable tribe has been extended which is very curious. A bird feeds upon the seed from some tree

plants after six years, and kidney beans taken from Tournefort's Herbarium a hundred years after they were gathered.

Seeds thus abundantly produced and securely preserved are scattered abroad by various agencies, not only in this manner filling up voids which would otherwise exist, but also preventing that barrenness and impoverishment which occur when they are accumulated in great numbers within too narrow a compass. 1. The force of the air or wind is a principal one among such agencies, and several circumstances in the structure of plants favour its operation: thus they are elevated and as it were exposed to its action upon stalks, while the seed-capsules open usually at the apex. And as to the seeds themselves, many of them are almost as fine and as volatile as the pollen or dust of the anther itself, and thus no place can be closed to the access of the fungi producing mouldiness, transported by the winds. Heavier seeds are supported by wings, which also waft them along. The seed-vessel of the elm is surrounded by a circular membranous wing; that of the ash is terminated by one that is oblong. The seed-vessels of the maple have two large side-wings; those of the fir, the cedar, and the larch, are furnished with a wing of great fineness. The seeds of syngeneseous plants are furnished with a feathery crown or aigrette, and look like small shuttlecocks. The separate threads that compose this aigrette distending as they dry, serve as levers to lift the seed from the involucre that holds it, and, when out, as a parachute to prevent it coming to the ground, and to buoy it in the air. A familiar and beautiful example presents itself in the seeds of the thistle and dandelion sailing along supported by their little tufts. Linnæus suspects that the *Erigeron Canadense* came through the air from America to Europe. The little cord which attaches the seeds of the dog's-bane, swallow-wort, periploca, &c. to their receptacles, and

which covered by a case can resist the digestive powers of the stomach — as the stone fruits, the nutmeg, or

the calyx of several of the valerians and scabies, form elegant aigrettes. Seeds may be carried by eddies of wind very far from the spot where they originally grew. Whirlwinds have been known to scatter over the southern coast of Spain those that had ripened on the northern coasts of Africa.

2. The waters are another great means for the transportation of seeds. Those of them whose capsules are firmly closed may be carried immense distances by torrents and rivers, or by the sea itself. Cocoa-nuts, cashew-nuts, and the pods of the *mimosa scandens*, sometimes of the length of two yards, with many other fruits of the tropical regions, are cast upon the shores of Norway, in a state to vegetate did the climate permit. Regular currents transport the large double cocoa-nut of the Sechelles to the coast of Malabar, at the distance of four hundred leagues from whence it was produced. Fruits brought by the sea have sometimes discovered the existence of unknown lands to the windward. By such tokens Columbus, in the search for the American continent, was apprised that he was not far distant from the land of which he had prognosticated the existence. Linnæus has some interesting observations upon this subject. "In Lapland we see the most evident proofs how far rivers contribute to deposit the seeds of plants. I have seen Alpine plants growing on the shores frequently thirty-six miles distant from the Alps. . . . The centaury is a German plant, whose seeds being carried by the wind into the sea, the waves landed this foreigner upon the coasts of Sweden. . . . Many have imagined, but erroneously, that seeds corrupt in water, and lose the principle of vegetation. Water at the bottom of the sea is seldom warm enough to destroy seeds; we have seen water cover the surface of a field for a whole winter, while the seed which it contained remained unhurt, unless at the beginning of spring the waters were let down so low by

the acorn. Having fed, say upon the acorn, it wings its flight many miles over a portion of the ocean ;

drains that the warmth of the sun-beams reached to the bottom ; then the seeds germinated, but presently became putrescent ; so that for the rest of the year the earth remains naked and barren. Rain and showers carry seeds into the cracks of the earth ; streams and rivers, which last, conveying them to a distance from their native places, plant them in a foreign soil."

3. Animals co-operate in an extensive degree in the dispersion of the seeds of plants. The squirrel and cross-bill are both very fond of the seeds of the fir ; to open the scales of the cones, they strike them against stones, and thus set free and disperse the seed. Birds swallow the berries, of which they digest only the pulp, but void the stones entire and ready to germinate. It is thus that the thrush and other birds deposit the seed of the mistletoe on the trees where it is found ; and indeed, destitute as this is of wings or aigrettes, it could not be disseminated in any other way, for it will not grow on the ground. The pocan or poke of Virginia (*Phytolacca decandra*), which was introduced by the monks of Corbonnieux into the neighbourhood of Bordeaux, for the sake of colouring the wine, has been since disseminated by the birds throughout the southern departments of France and in the deepest valleys of the Pyrenees. The Dutch, with the view of monopolising the trade of nutmegs, extirpated the trees on those islands which they could not watch so narrowly as the rest ; but in a short time these very islands were re-stocked with nutmeg-trees by the birds, as if nature refused to admit of such an encroachment on her rights. Granivorous quadrupeds disseminate the seeds they do not digest. The newly manuring a field will cause innumerable weeds to spring up, which did not exist there before. The hoards of fruits or seeds (for fruits are but the envelopes of seeds) which various animals make, such as crows, rats, dormice, &c., are frequently forgotten, or, by the

alighting in some plain, the seed is deposited by the bird; it vegetates, the acorn becomes an oak, the grain

destruction of the animal, neglected and lying dormant where they were placed during the winter, germinate in the spring. The fruit of the prickly-seeded scorpion-grass, of clovers or goose-grass, of the wood-sanicle, are all provided with small hooks by which they lay hold of the fleeces of sheep, cattle, &c., and are thus carried with them. Linnæus enumerates no less than fifty genera armed in this way.

There are particular plants, such as the pellitory of the wall, the nettle, and the sorrel, that may be said to seek the society of man, and actually to haunt his footsteps. They spring up along the wall of the village, and even in the streets of the city; they follow the shepherd, and climb the loftiest mountain with him. "When young," says M. Mirbel, "I accompanied M. Ramond in his excursions in the Pyrenees, where that learned naturalist more than once pointed out to me these deserters from the plains below; they grew on the remains of ruined hovels, where they kept their station in spite of the severity of the winters, and remained as memorials to attest the former presence of man and his flocks."

4. Seeds often assist as it were in their own dispersion. In the balsam, the catchfly, fraxinella, sandbox-tree, &c., the valves of the seed-vessels open with a spring that projects the contents to a distance from the parent plant. The gourd of the squirting cucumber, by a contraction which takes place at the moment of its fall, darts out the seed along with a corrosive fluid by a vent formed as it quits the stalk. The pouch which contains the seed of the wood-sorrel, on the termination of its growth, bursts, and shoots out the seeds by an elastic movement. Among the mushroom tribes, some of the species of peziza impart a vibratory motion to the cap or cover which bears their seed when that is ripe. Puff-balls burst at the top like the crater of a volcano;

of mustard-seed a tree, in time the sandy plain becomes fruitful, an oasis arises in the desert. How was

and the seed is in such quantity, and so fine, that when it escapes it has the appearance of a volume of smoke. The capsules of ferns, contracted while ripening, open with a spring. A like cause gives motion to the cilia or inner fringe which surrounds the urns or seed-vessels of mosses. Linnæus enumerates fifty genera whose seeds are dispersed by some of the means to which we have just alluded. He also mentions another very remarkable mode in which they sometimes assist their projection. "The *crupina*, a species of centaury, has its seeds covered with erect bristles, by whose assistance it creeps and moves about in such a manner, that it is by no means to be kept in the hand. If the bearded-oat after harvest be left with other grains in the barn, it extricates itself from the glume. Hence the Delecarlian, after he has cut and carried it into the barn, in a few days finds all the glumes empty, and the oats separate from them; the spiral arista or beard of the oat is contracted in wet and extended in dry weather; when it is contracted, it drags the oat along with it, for as this is bearded with minute hairs pointing downward, the grain necessarily follows it. The seeds of the equisetum or fern, viewed upon paper through a microscope, seem to be endowed with a description of leaping movement.

Distances, chains of mountains, rivers, the sea itself, are unavailing barriers to the migration of seed. Climate alone can set bounds to the dispersion of the vegetable races. In process of time it is probable that most of the plants which grow within the same parallel of latitude will be common to all the countries comprised in the entire zone of it; an event which would be one of the great blessings resulting from the industry and persevering intercourse of civilized nations. But no human power will ever force the vegetable of the tropics to endure the climate of the poles, nor *vice versâ*. Here nature is too strong for man. Species

it formed? what was the transport-ship commissioned by nature to convey to the wilderness the fruitful seed? Mark the answer — the stomach of a little Bird.

Returning to the animal kingdom, and looking again carefully at the evidence collected, the accumulated

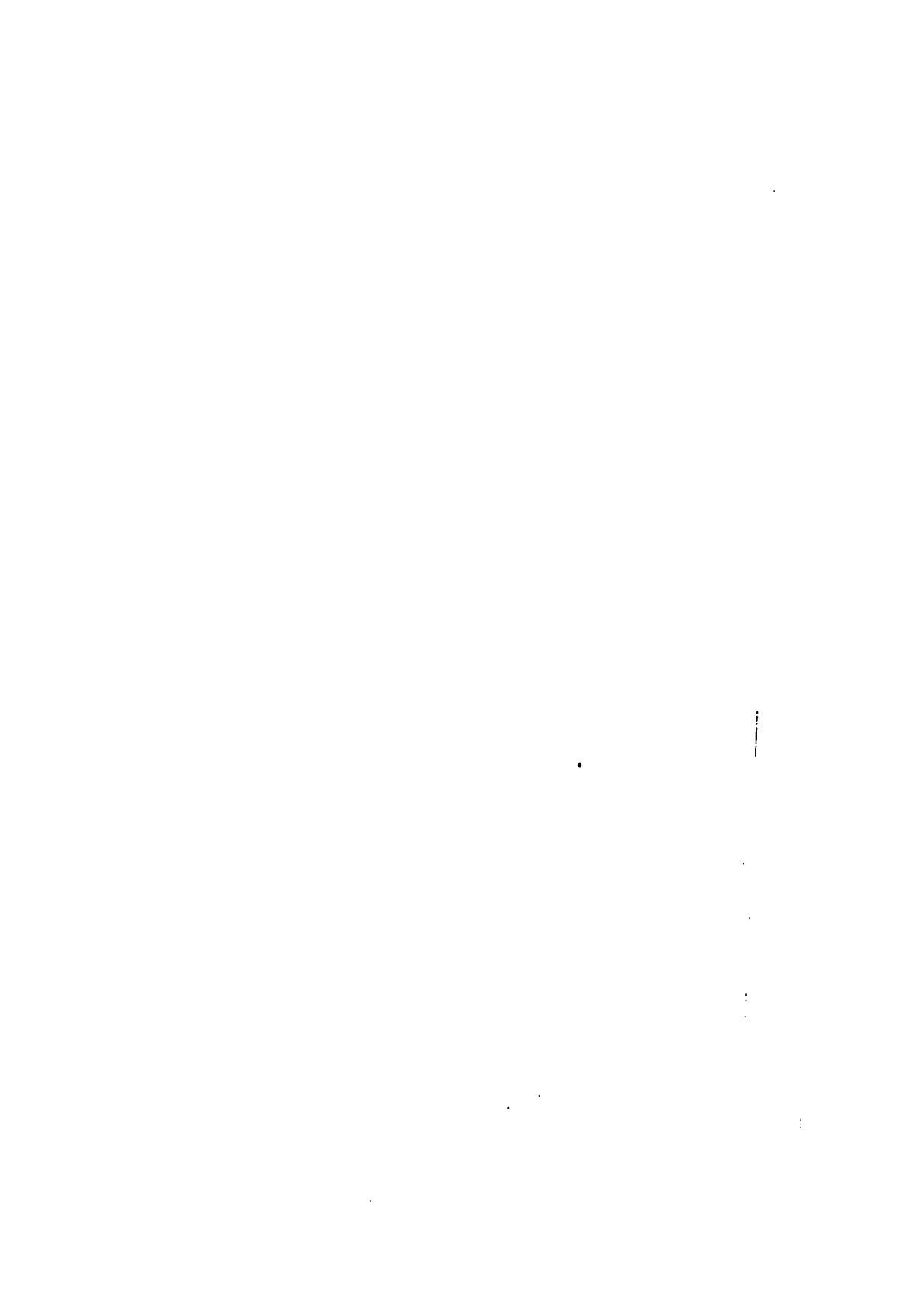
cannot spontaneously spread themselves from one pole to the other, the intermediate differences of temperature preventing such progress; but we may assist in transporting them, as we have done successfully in various instances. We have already transplanted the eucalypti, the metrosidera, the mimosas, the casuarinæ, and other plants of Australia into our own soil, while the gardens of Botany Bay are stocked with the fruit-trees of Europe. A similar mutual interchange of the vegetable productions always promotes the progress of that civilization of which it is one of the effect.

M. Mirbel concludes his paper with the following passage:—

“The dissemination of seeds completes the round of vegetation. The shrub and the tree are bared of their foliage: the herb is dried up, and returns to the earth from which it came. That earth appears to us as if stripped for ever of her gay attire, yet countless germs await but the stated season to re-adorn her with verdure and bloom. Such is the prodigal fertility of nature, that a surface a thousand times the extent of that of our whole globe would not suffice for the seed-harvest of a single year, provided the whole was suffered to re-appear; but the destruction of seed is endless, and only a small portion escapes to rise again. In no way in our view are the power of nature and the immutability of its laws more strikingly displayed than in the successive resurrections of the types of bygone generations.”

The study of Botany is doubtless one of peculiar interest, opening a garden over the gate leading to which is ever written this invitation—“*Enter, for God is here.*”

facts all lead to the conclusion, that the first dispersion of animals and vegetables, after the flood, took place from many separate points. It is probable that at least each of the great mountain chains and table lands were originally furnished by the Divine Creator of all things with a stock of animals, and that the offspring of each species has since spread themselves to as remote a distance from the spot in which they first existed as their locomotive powers, their capability of resisting changes of climate, and the absence of physical obstacles to their further progress, may have allowed them to wander.





CHAPTER IV.

**MAN—VARIETIES OF THE HUMAN RACE—
THE MANNER IN WHICH THEY MAY BE
ACCOUNTED FOR.**

MAN stands highest in the scale of animated nature, displaying in the greatest degree evidences of the Creator's skill. The physical character of man, although it be not such as to exempt its possessor from those laws of generation, of growth, and of dissolution, which prevail among the inferior tribes of animals, is nevertheless of a peculiar and pre-eminent kind. His organization more perfect and complex than theirs,—his erect and noble aspect,—his form better suited for rendering obedience to the impulses of a rational and intelligent mind, all most essentially distinguish him from the brutes over whom he exercises sovereign dominion.

*Pronaque cum spectant animalia cætera terram
Os homini sublime dedit; cælumque videre
Jussit, et erectos ad sidera tollere vultus.*

OVID.

Under such circumstances as these it is not a little surprising that there should have existed naturalists

who pretended to confound the human species with tribes of the lower animal creation. Fallen must that man be,—degraded the intellectual faculties of that would-be philosopher who supposes man, formed after the image of his God, destined for no other end than the moth which sinks into the taper's flame, the monkey, or the chattering chimpanzee.

In the world around us it is observed, that although every thing is in a state of change, yet nothing is lost; even "the dew becomes the essence of the flower, on which the insect feeds;" and thus it appears clear that the power of nature knows not annihilation. It is true that man does not possess the means of penetrating the councils of the Omnipotent; still he may ask, is all immortal save the mind of man, the masterpiece, the glory of the whole, the wonder of creation? He may ask if the space of mortal life terminates the duration of the soul? He may enquire, Is man, the favoured creature of nature's bounty, whose spirit holds communion with celestial powers, to perish with the outer shell of clay? Are generations after generations of his race doomed to follow an endless succession, rolling down the stream of time, to pass into the ocean of eternity, leaving no trace behind? Is the power of Jehovah limited, ends it with the passing scene? or do we discover in the spiritual constitution of man the traces of loftier powers, of which those he now possesses are but rudimentary? some embryo faculties which raise our thoughts from earth to fix them on the *great first cause* governing the universe? Do we not feel that the mind is little in harmony with the earthy fetters by which it is bound down? Have then these

yet unquenched desires, to drink, more deeply drink, of the stream of knowledge, to aspire more and more ardently after moral good, been planted in our minds in vain? Doubtless this question may be answered from the highest source, for happily the sacred word of truth affords a bright and ever burning lamp to light our dark and trembling steps—to cheer our sinking hearts—to animate the drooping mind in our gloomy pilgrimage—to display even in this world the dawning of futurity—to elevate our desires to nobler objects than belong to this transitory sphere.

It is not denied that in some respects the peculiar organization of man subjects him to great disadvantages; the extreme feebleness of the human frame at the first period of its existence; the slowness of its growth; the multiplicity of its wants; the variety of ills and infirmities to which through life it is exposed, have no parallel among the beasts of the field. Yet who that considers the present moral imperfections of man can deny the good which results from these physical disadvantages inseparable from his condition. Endued with the strength of the lion or the elephant, or clothed with the skin of the rhinoceros, impervious alike to heat and moisture, he would perhaps have for ever remained sunk in selfish ignorance, and ignorant of all the arts which embellish life. But a sense of his wants, the knowledge of his weakness has aroused faculties which would else have for ever lain dormant in his mind,—has, by uniting him to his fellows, given rise to the most endearing ties and the most useful forms of society, and has so called forth his inventive resources, that he has acquired to a considerable extent

the command—aye, and the direction too, of the works of nature. Exercise then being the school for intelligence and ingenuity, a theatre, a stage, a world in which variety and change are the predominant features, is well fitted for the abode of an intelligent being like man. Every material that is to supply his wants and necessities is presented in a crude state in order that he may exercise his talents. Thus the diamond requires to be polished before it becomes the brilliant gem that process discloses. The pearl is entombed at the bottom of the ocean; the iron is buried in the bowels of the earth; the shaft must be formed; the aid of the rail-road secured; the ship commissioned; the briny deep traversed; hundreds of our fellow men employed, before the coal cheers the domestic hearths of this metropolis: even a great part of our food requires cultivation, for perhaps in no part of the globe are the spontaneous productions of nature fitted for our use. Labour is the only coin by which food and shelter can be procured.

The researches of modern navigators have shown that the human race is spread nearly over the whole earth. It has been found in the midst of the most sultry regions, in the vicinity of the pole, and upon islands cut off apparently by a boundless ocean from all communication with the rest of the world. The islands of Spitzbergen and of Nova Zembla to the north, and the Sandwich Isle, and isles of Faulkland and Kerguelens-land to the south, are the only countries of considerable extent which have been found destitute of human inhabitants. The *Oases* or islands of verdure scattered here and there over the

sands of Africa are also seats of population. In one part of the world the human body sustains a heat higher than that at which æther* boils; in another is exposed to a cold which occasions the congelation of mercury.†

Notwithstanding the dissimilarities of structure and complexion which are observed on comparing the natives of different countries, there are the strongest reasons for believing that the human race forms not only one genus, but also a single species; or in other words, that all the several varieties of men sprung originally from one pair of individuals. Though this assertion is made without reference to the word of God, it may nevertheless be necessary to remark that the Bible supplies no reason for doubting its truth. Taught by that sacred volume, we find that the earth was re-peopled after the flood by the three sons of Noah. By this exact authority we learn also that the primary races of men were three; 1. the Shemites; 2. the Hamites; and 3. the Japhethites.

During the time which intervened between the deluge and the dispersion at Babel, these original races it is probable progressively divided into generic families, although "the whole earth was of one language and of one speech." But when God had "confounded their language that they could not understand one another's speech," their division into new families and into new

* Æther boils at a temperature of 98° Fahrenheit.

† Mercury becomes congealed when the thermometer falls 40° below zero.

tribes would as a matter of course be more frequent. It is also not at all improbable that a supernatural distinction by moral and physical characters, giving as it were origin to new races, would accompany the miraculous confusion of tongues. To deny the possibility of this, is to limit the powers of the Omnipotent; to limit the divine energy of that almighty Being, who created man and endued him with the wonderful attributes of body, life and mind, at the beginning. That nothing is impossible to the Almighty admits of easy demonstration: we see traces of his power and wisdom every where; and unlimited must be the power of that Being, who made the world we inhabit, with its seed-time and its harvest, its summer and its winter; who gave and continues to give light to the sun which shines from yonder heaven; who wields the machinery of the universe, and scatters the golden dust upon the petals of the flower.

It is easy to discover in the difference between the means adopted for peopling the earth with the human race, and those provided for covering it with the inferior tribes of animals, the traces of that wisdom which uniformly pervades the arrangements of Providence. Had there been in the first instance no more than one pair of each genus of animals, and one individual of each tribe of plants, and had these been called into existence only upon one spot of the earth, large regions separated by wide seas and lofty chains of mountains from the country containing that single spot, would for ever have remained almost, if not entirely, destitute of plants and animals, unless at the same time means had been provided for their dispersion

far more effectual than any at present observed in operation. To prevent a result so little in harmony with what appears to be the general system of the universe, each separate region of the globe was supplied with a distinct stock of plants and animals. But in the instance of the human family such a plan of proceeding was not requisite. Man was endued with a constitution capable of resisting the greatest changes of climate, and with the power of inventing methods for protecting himself against atmospheric influence; He was also enabled by the same power of invention to transport himself over the most extensive seas and across the most formidable ranges of mountains. Furnished with these capabilities, his race was originally placed in only one spot of the earth.

In order more fully to understand the question at present under discussion, it will in the next place be necessary to explain what is meant by the terms *genus* and *species*, of which frequent use has been made in the present volume. A race of animals or a tribe of plants, marked by any peculiarities of structure, which from one generation to another have always been constant and undeviating, form a species; and two races are held to be specifically distinct, if they are distinguished from each other by some peculiarities which in the lapse of ages the one cannot be supposed to have acquired, or the other to have lost, through any known operation of physical causes; so that under the term species are comprised all those animals which are supposed to have arisen in the first instance from a single pair. The term *genus* has a much more extensive application. There are several species which

so exactly resemble each other as immediately to suggest the idea of some near relation between them. The horse, the ass, the zebra, and others of the horse kind are instances of this remark; the different species of elephant another; and a third is furnished by the several kinds of oxen, buffaloes, bisons, and so on, all belonging to the ox genus, and bearing a striking resemblance one to the other. As we are aware of no physical causes which could have operated so as to produce these differences of structure which exist between the several species of one genus, it is concluded that they originally sprung from different individuals. A *genus* consequently is a collection of several *species* on a principle of resemblance, and therefore it may comprise a greater or less number of species according to the peculiar views of the naturalist.

Dr. Prichard in his admirable work mentions the criteria which may be used in order to determine whether all the races of men belong to the same species. The first of these is furnished by the general laws of their animal economy, since should it appear that in two races of animals the duration of life is the same—that their natural functions observe the same laws—that they are susceptible of the same contagions—there is a very strong presumption that they are of the same species. Another way of examining the subject is to inquire whether the diversities in mankind are strictly analogous to the varieties in form and colour which occur in the lower departments of the animal kingdom within the limits of the same species. There is another method, however, which perhaps bears more directly

upon the question, viz. to discover what is known respecting the springing up of varieties among the human race. And first with regard to the laws of the animal economy it may be inquired whether there are any peculiarities which distinguish one race of men from another, of such a description as to render it probable that they constitute distinct species? Certain writers tell us that there is a difference between Europeans and some other nations, in the duration of life. It is not contended that life in the savage, as a general rule is so long as in the more civilized races of men, a circumstance sufficiently explained by their addiction to intemperate habits, and their constant exposure to fatigue and hardships. But when they have not such disadvantages to contend against, their term of life appears to be quite as long as in other men. Several instances may be cited both of Negroes in the West Indies and native Africans having attained a very advanced age; and among the inhabitants of America cases of longevity are very far from uncommon. Humboldt mentions the name of a Peruvian who lived to the age of one hundred and forty-three, and who thirteen years before his decease could travel on foot a considerable distance. The Laplanders also are said to be remarkable for living to a good old age. As to diseases, it is an undoubted fact that all human contagions and epidemic complaints exert their pernicious influence on all the tribes of men, though the natives of particular climates suffer more than others. And as to constitutional complaints the difference is only one of predisposition, and perfectly analogous to what is daily witnessed in distinct families in the same nation, some

being constitutionally more liable to certain complaints than others: thus that most fatal of Pandora's train, consumption, is hereditary, descending from father to son, then perhaps lying dormant, and again breaking out in succeeding generations of the same family. Gout also visits the feet and hands of certain families; the most temperate man is now and then attacked with it; his father too was a most temperate man, and had never had the complaint at any period of his life; the great, great grandfather was however the mayor of some celebrated corporation, a fine "old English gentleman," famed for the good things of the table; and thus through the toe of his unfortunate descendant this family heir-loom is handed down for the benefit of future generations. The only difference between the constitution of the American and the European, is that for the most part the latter is more irritable.

The conclusion arrived at therefore from the first method of inquiry, is that the grand laws of the animal economy are the same in their operation upon all races of mankind. The slight deviations which occur are not greater than the common varieties of constitution which exist within the limits of the same family. Here then is one strong presumption in favour of the inference that all men belong to one species; for it appears that among animals neighbouring species so closely allied as often to have been mistaken for mere varieties of the same stock (as the wolf, and the dog,) differ very materially in the laws of their animal functions. The next mode of inquiry suggested is how far the diversities of complexion, figure, and stature, seen among the several races of men, are in

unison with those varieties which in the inferior animals often occur without making any specific difference, and originate before our own eyes, and within the limits of a single species?

One, and that the most obvious to common observers, is the colour of the skin? What can be more striking than the difference between a black man and a white man? It is found also that there is a correspondence between the colour of the hair, the skin, and the eyes of individuals; with few exceptions light coloured eyes are joined to a fair complexion and light hair; but a relation of the colour of the hair to that of the skin is perhaps universal; for although the ladies of Barbary have very fair, white, and delicate complexions joined to very black hair, this is to be attributed to art and careful protection from the sun; therefore this fact does not bear against the rule just laid down. Dr. Prichard, taking the hue of the hair as the leading characteristic, divides mankind into three principal varieties of colour, which he calls the Melanic, the Xanthous, and the Albino. The first includes all individuals, or races having black hair; the second those having either brown, yellow, flaxen, or red hair; and the third those having white hair and red eyes. The Melanic forms by far the most numerous class of mankind; it is the complexion generally prevalent except in some particular countries; chiefly in the northern regions of Europe and Asia where races of the Xanthous variety have multiplied. The hair of the head in the Melanic race is of various textures, from the long lank hair to the crisp hair of the African Negroes. Examples of the Albino variety have been

noticed in almost every country. In Europe they are by no means uncommon. Sixteen instances have been seen by Professor Blumenbach in Germany, and their existence in other countries is proved beyond the shadow of a doubt.

A remarkable circumstance, yet by no means a very uncommon one, is the birth of white Negroes among the black races of Africa. They are looked upon as curiosities, and are often collected by the native princes; their hair is of a woolly character, and many of them are true Albinos.* The Xanthous variety may be considered as intermediate between the two, prevailing in the colder parts of Europe and Asia, where it sometimes runs through whole tribes. The Jews, like the Arabs, are generally black-haired, but many may be seen with light hair and eyes, and the same remark will apply to the Russians.

Varieties more especially of the shape of the skull furnish another grand instance of diversity among the

* My attention was drawn, a few days ago, by Mr. Charles Guthrie to a patient at the Ophthalmic Hospital. He was very tall, the features those of a Negro, the head long and narrow, and covered with crisp woolly hair. The skin was white, the hair yellow, and other characteristics which were present convinced us that he was a true Albino. We were also made acquainted with the curious fact, that there is at present residing not far from London a child, the face, hands, arms, and neck of which are white, the legs and a portion of the abdomen being black. Some years ago a patient was brought to one of the London Hospitals partly black and partly white.

racés of men. The ingenious Professor Blumenbach has made the varieties in the construction of the skull the basis of a division of mankind into five principal races or departments :—

- I. THE CAUCASIAN.
- II. THE MONGOLIAN.
- III. THE ETHIOPIAN OR NEGRO.
- IV. THE AMERICAN.
- V. THE MALAY.

The first three are more strongly marked as regards the skull, the other two are only approximations of the former. In the first class is found the natives of Europe and some of the western Asiatics ; the head is almost round and of the most symmetrical shape ; the cheek bones without any projection ; the face is oval with moderately prominent features. In the second class the head is almost square ; the cheek bones projecting outwards ; the nose very flat ; the face broad ; and the inner angle of the eye depressed towards the nose. In the Ethiopian the head is narrow and compressed at the sides, having the forehead very convex and the cheek-bones projecting. The fourth variety approaches the Mongolian, but the cheek bones are more prominent and rounded. In the fifth variety the top of the head is slightly narrowed, the face being wider and the features better marked than in the Negro. Each of these divisions requires a separate examination.

I. THE CAUCASIAN.

This race includes the following families:—The Caucasian, Celtic, Germanic, Arabian, Labyan, Nilotic, and Indostanic. It need only be remarked further, that the skin is very fair and of various tints; the hair varies in colour; the skull is large and oval; the anterior portion very finely formed; and the head large in proportion to the face. This race stands pre-eminent for the facility with which the highest intellectual powers are acquired.

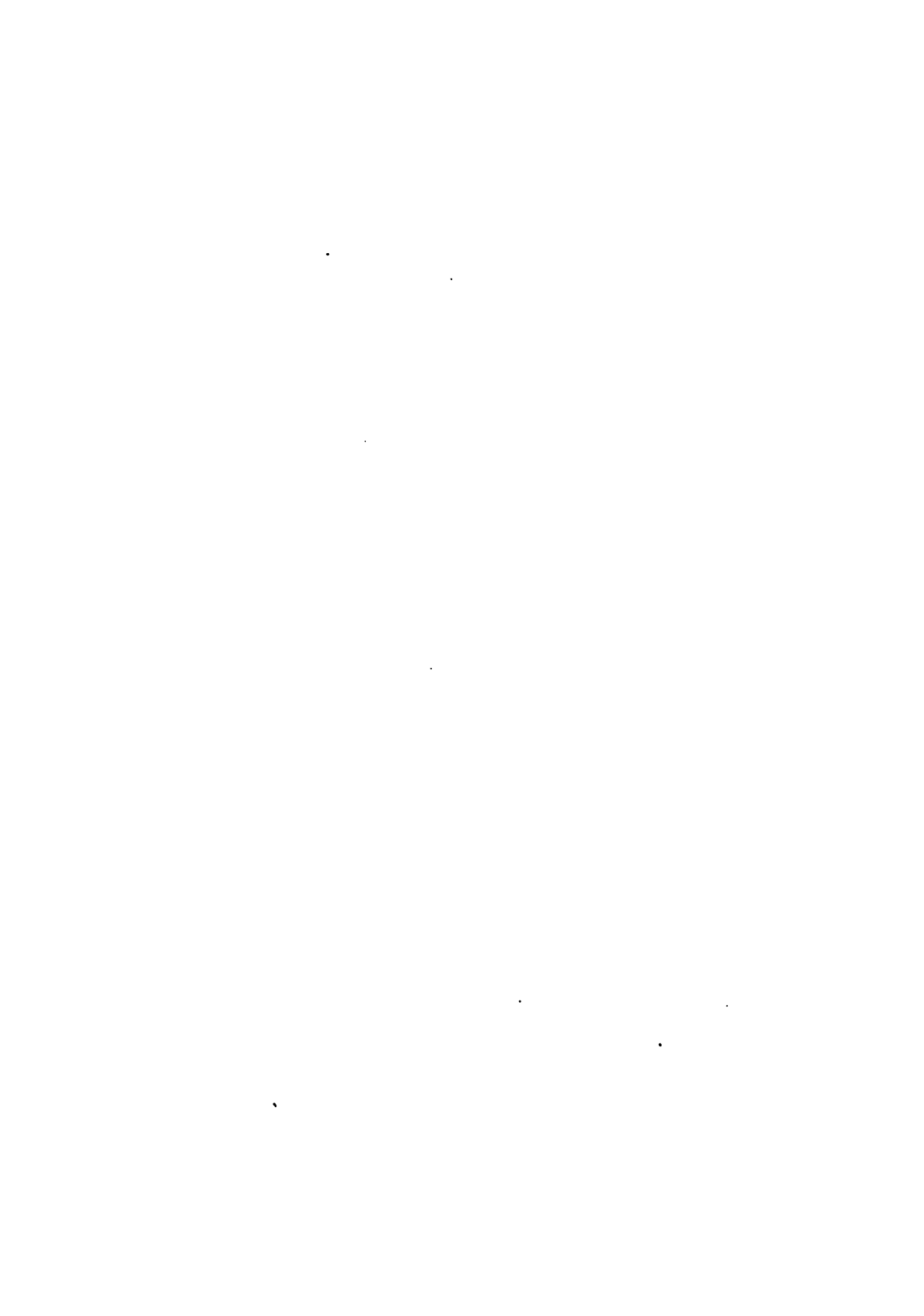
II. THE MONGOLIAN.

A sallow olive-coloured skin drawn tightly over the cheek-bones like parchment; the hair is long, straight, and of a dark black shade. The members of this family are not devoid of talent; they are ingenious and moderately capable of improvement. Blumenbach includes under this title, the Chinese, Indo-Chinese, and Polar tribes; also the Mongol-Tartar and Turkish tribes.

III. THE ETHIOPIAN.*

Large eyes, broad and flat nose, thick lips, black complexion, black crisp woolly hair, and a long narrow

* Writers seem ever at a loss how to speak of the mental powers of this race. They present a singular diversity of intel-





Skull altered by artificial means.



Skull of an Englishman.

head, are the leading features of this race, which contains the Negro and Oceanic—Negro, Caffrarian, Hottentot, and Alforian families.

IV. THE AMERICAN.

This division includes also the Toltican family. It is only necessary to remark the brown complexion, long lank hair, scanty beard, black sunken eyes, and the small skull, wide from side to side, and flat at the posterior portion.

V. THE MALAY.

The Malaysians are a maritime and migratory race, active and ingenious. They are of a tawny hue for the most part, but their dark complexions vary, from the colour above mentioned to a deep brown. The hair is black and coarse, the skull squared, and the forehead low. (Includes the Malay and Polynesian families.)

It remains only to examine the formation of certain skulls altered by artificial pressure during infancy, when the bones are soft, of which the drawing is a

lectual endowment, of which the lowest extreme is the humblest grade of humanity; and yet this diversity, whatever it may be in degree, is the same as may be observed, on comparing the mental attributes of the inhabitants of the smallest village, in this or any other country.

correct representation. It is a very singular fact that some infants immediately after birth are placed in a cradle so formed that the head can be compressed, and to such an extent is this carried that the poor little victim remains for hours, suffering under the application of this bandage, its little eyes forced almost from their orbits. This is continued till the head becomes flattened, and never recovers its rotundity. I have examined several of such skulls brought from Titicaca in Peru, where it appears the most devoted adherent of good king Charles never had a greater aversion to a round head than these poor savages. Dr. Morton, in his *Crania Americana*, has given us several drawings of crania so altered by this pressure as to have almost lost the outlines of humanity. In one skull brought from Peru the intervention of art is very manifest in the depression of a forehead naturally low, the lateral swell is not remarkable and the parietal protuberances are flattened, and these two last peculiarities are known to be types of the formation of the head in these people. Dr. Morton, after examining the skulls of various tombs, proceeds to show, that notwithstanding the heads are so small and so badly formed, the people were not devoid of intelligence; and reasoning upon the disintombed skulls before him, he next traces (from the many interesting facts adduced in his work)* the existence of civilization in Peru to a very remote period. The *unsophisticated* Americans are by Dr.

* See the next chapter.

Morton divided into three great classes, those devoted to agriculture, fishing, and hunting; and from one of these employments deriving the sole means of subsistence. He has examined the moral attributes of the American savage with great care and fairness, and recognizes a boldness of physical development accompanied by a corresponding acuteness in the organs of sense, partly natural, partly the result of education. He rejects, and justly, the theory before alluded to that makes the American race, in comparison with the European, subject to a natural inferiority, lower powers of endurance, and less hardiness of constitution. It is only necessary to place an object before him, be it revenge or be it the obtaining of food, and the Indian will follow it by day and by night; in sunshine and in storm; through rivers, marshes, or thick forests. Human effort never exceeded his; human patience never more fully awakened the moral power of the mind to resist the calls of hunger and thirst. True, he is incapable of servitude; he pines away under the chain of slavery; his spirit sinks, his health is broken, his natural energy slowly decays, and do you blame him? No, in his own land, in the country of which he is lord, the Indian cannot wear the fetter of the slave—he pines—he dies—he proves himself possessed of a nervous sensibility worthy the most exalted tribes of men. If we follow him to his hut he is little to be admired. He is a drone and a despot; cold to his wife, and stern to his children. The Indian is also less swayed by superstitious fears than many other savages. His religion is simple; a good spirit the author of good, an evil spirit the author of misfortune. He

believes also in a future state where he will enjoy hunting, fishing, and every sensual gratification. He has great veneration for the dead, and frequently on changing his habitation removes with him the remains of his relatives and friends.

The length to which these observations have already extended prevent a *minute* examination of the Jewish people. Originally the Hebrews were a pastoral race, but in later times occupied the cities and territory of Palestine under a changeful government of judges and kings. Their physiognomy is familiar in the receding forehead, elongated face, and aquiline nose. Driven from their homes by the Romans, their nation has long been extinct, and they are now the outcasts of every land. Dispersed by the divine authority, we see them in every portion of the habitable earth, recognized by the same features—the same undeviating form of worship—the same obstinacy of purpose—the same determination to resist alike the evidence of facts and every attempt at conviction. This remark is applied to the race as a whole; every one, however, must know many exceptions, and cannot but admire, while they lament, the pertinacity with which they still cling to hope, the fervour with which they offer up in their temples the prayers of their fathers.

To return, however, to the skull. The descriptions given convey an idea of the five principal varieties in the form of the human head; nevertheless the attempt to assign them as distinctive characters of so many races of men is open to many objections, since, whether we take as a standard the figure of the skull or perhaps any other peculiarity of structure, it is impossible in

reference to that standard to divide the human species into departments such as can with any probability be regarded as so many separate races or families. The varieties in the formation of the body, as well as the proportion and shape of the limbs, it is quite unnecessary here to investigate. The same remark, however, applies to them also which was made in relation to the formation of the skull.

Let us next compare the diversities, of which a sketch has been given already, as existing in the varieties of the human race, with the variations in structure, form, and colour, observed in the lower animals. The difference in colour seen in the lower animals (quadrupeds) of the same species requires no comment. We constantly remark it in horses, oxen, cats, dogs, and rabbits; and among wild animals a white individual not unfrequently springs up. A very beautiful instance of the truth of this assertion is afforded in the white mouse (*Mus Musculus* var *Albus*), which is the well known Albino variety of the common mouse. Blumenbach also mentions many instances which warrant our supposing that these varieties of colour depend upon local circumstances. He states that the swine of Piedmont are black—those of Normandy white—and in Bavaria they are found of a reddish brown. In birds the same thing is observed. The turkeys of Normandy are black—those of Austria almost white. In Guinea the dogs and gallinaceous fowls are as black as the natives. Even in our own country certain colours may be seen pervading the cattle of particular districts. With respect to horses the writer just quoted observes, that there is less differ-

ence in the form of the skull in the most dissimilar of mankind, than between the elongated head of the Neapolitan horse and the skull of the Hungarian breed, remarkable for its shortness and the extent of jaw. It is certain that before the discovery of America by the Spaniards swine were unknown in this quarter of the globe, and they were first carried there from Europe. Yet notwithstanding the comparative shortness of the interval, they have in that country degenerated into breeds differing most remarkably from the original stock. These may be adduced as instances of variety arising in the same stock, and says Professor Blumenbach, "no naturalist has carried his scepticism so far as to doubt the descent of the domestic swine from the wild boar. I have (continues he) no hesitation in saying that the difference between the cranium of the Negro and of the European, is not greater than that between the cranium of the wild boar and of the domestic swine." These facts, capable of being again and again multiplied, (as will be seen by the last chapter of the present volume,) prove, that in the lower orders of animals there spring up in the same species varieties of an analogous or similar kind to those which mark the different races of men, and the existence of this analogy confirms still more the opinion expressed as to the unity of our species. But what are the facts that have been collected justifying the assertion that varieties have arisen in a family or race of men similar to those diversities which distinguish one nation from another. It is needless to repeat the well-attested fact, that among Negroes and other dark-coloured tribes, individuals of the Albino

and Xanthous complexions are not unfrequently born; and with respect to form and structure, and the texture of the skin and hair, many instances are recorded wherein surprising peculiarities have made their appearance in a race or family, and some few in which these have been transmitted to their descendants. For example, a singular change has taken place in the physical characters of the Funge, the conquerors of Sennaar, who though descended from the Shilickh Negroes have no longer the genuine characters of the Negro race. One of the peculiarities is the frequent appearance among them of a red complexion joined to red hair. If then we apply to the subject under discussion the several criteria stated at the commencement of this investigation, the results every one blend most harmoniously in leading to the inference that the inhabitants of each quarter of the globe originally descended from the same parents. This conclusion is drawn—

I. *From the grand laws of our animal economy*, allowance of course being made for the effects of climate and particular habits.

II. *From the existence in the same species* among the inferior tribes of the creation, of varieties analogous to those which occur in mankind.

III. *From the circumstance of varieties being really known to have sprung up among men*, more or less similar to those which distinguish different nations. There is, however, a point at which this similarity terminates; the peculiarities which arose in the human species at a remote and unknown period have become the characteristic marks of large nations; whereas those

which have appeared in later times, have scarcely extended beyond the individuals themselves.* In the early periods of the world, when mankind, few in number, were beginning to disperse themselves in detached bodies over the face of the earth, the case was altogether different, and we can easily understand how, if any varieties of colour, form, and structure then originated in the human race, they would naturally, as society multiplied, become the types of distinct nations. These considerations may suggest to us the manner in which natural diversities first obtained their ascendancy; the cause of such diversity is unknown; the subject is, and perhaps ever will remain enveloped in mystery, surrounded by a cloud our reason cannot penetrate; but the inference as to the unity of the human family is not weakened by our inability to assign those causes, since we are ignorant of the causes even of the varieties which sometimes display themselves, within the limits of a single family.

An attempt has been made to prove the unity of our species from the many facts already recorded, and it is not a little pleasing to find that science confirms the declaration of the book of heaven, viz. that "Eve was the mother of all living:" how is pride humbled when we dare carefully to examine these things; when we call to mind that lord and peasant, white man, red man, and

* This argument (no new one it is true) is entitled to attentive consideration. In a moment it will be carried out by the mind of the professional reader, as will also the argument as to the physical constitution of the mule, which is most conclusive.

black man are alike. All gaze upon the starry vault of heaven, drink of the stream, partake more or less in like manner of the fruits of the earth ; are born in the same helpless condition, arrive by slow degrees at maturity ; and subject to the same diseases, the same cares, the same infirmities, find at length all fancied distinction ending in the tomb : be it beneath the ocean's wave, in the sandy plains of India, in the village churchyard near the cottage in which they have lived through life, or the ancestral vault. I repeat that all are equal in this point of view : the warriors who lead our fleets and armies to battle, the minister who wields the helm of state, the Bushman and Hottentot, black man and white man, the young and beauteous Queen who sits upon our throne, her royal babe, the negro, and the swarthy African, are all closely bound by the chain of relationship, are all descended from one common dust. "O eloquent, just, and mighty death ! whom none could advise thou hast persuaded ; what none hath dared thou hast done ; and whom all the world has flattered thou only hast cast out of the world and despised. Thou hast drawn together all the far-stretched greatness, all the pride, cruelty, and ambition of man, and covered it all over with these two narrow words *hic jacet*."

I have also endeavoured to defend our species from the attacks of men who have written accounts of the regular gradation in men and animals ; who have asserted that the Orang-outang has the manners, person, and action of a man, and that the African is a kind of connecting link between man and the brute creation : from men "who laughed and wondered that a negro's soul could feel." Why has the negro been thus selected ;

thus likened to a brute, thus sunk below the level of the species? For the purpose of degrading him, thereby to palliate the cruel hardships under which he groans? Is it for this? Is it to justify the tearing him from his home, wife, children, father-land, his all? Is it to justify the selling him in the market as a beast? Is it to blunt the stripes that fall upon his lacerated back? Is it to gild with the sunbeam of humanity the black plague cloud of slavery that still hovers, in all its darkness, in all its bitterness, in all its sin-polluting stains, over that boasted land of freedom, America? We know not—but we know—

That he is man, though sweet religion's voice
 Ne'er bade the Negro in his God rejoice;
 That he is man by sin and suffering tried,
 Man, fallen man, for whom the Saviour died.

A more simple way of examining the subject may be presented in the words of a poor Esquimaux, who told one of the missionaries that "he had often reflected that a Kadjak with all its tackle and implements does not grow of itself into existence, but must be made with labour and contrivance; but a bird he added is made with greater skill than the best Kadjak, and yet no man can make a bird." I bethought me, said the poor Greenlander, that he proceeded from his parents, and they from their parents: there must have been some first parents, whence did they come? Certainly I concluded that there must exist a being able to make them and all other things, a being infinitely more mighty and knowing than the wisest of men.

Tracing the animal kingdom from plant animals we have come to man, who exhibits by external signs what passes within him—by words, and this sign is universal. The savage and the civilized man have the same powers of utterance ; both speak naturally, and are equally understood ; and it is not owing, as some have supposed, to any defect in their organs that animals are denied the power of speech, the tongue of a monkey being as perfect as that of a man. It is true that several animals may be taught to repeat sentences ; even birds can do this. Many heard the canary at the Adelaide gallery which could say, "*Dick! sweet pretty little Dick!*" a convincing proof that the non-possession of the power of speech does not depend upon any defect in their tongue, or in the nerves supplying it. But to make them conceive the ideas which these words express is beyond the power of man. They repeat and articulate like an echo or machine, but do not comprehend the meaning of the words uttered, being as incapable of understanding a single word as the wood which composes the speaking machine* of Professor Wheatstone. Language implies a power of thought, and for this reason animals are denied the power of speech, the possession of which therefore corresponds to the more numerous, diversified, exalted, and moral attributes of man, and are a necessary aid to their developements. With the operations

* By this curious machine two or three vowels and the letters P, M, Sh, Th, and R, could be sounded.

of animals always performing the same work in a similar manner,* (the execution of any individual being

* For example, the nests of birds, discovering many curious objects which cannot but be interesting to the human mind. It is impossible not to admire those little regular edifices composed of so many materials collected and arranged with so much pains and skill, and constructed with so much industry, elegance, and neatness, with no other tools than a bill and two feet. That men can erect certain buildings according to certain rules of art is not surprising, possessing as they do the power of reason, which enables them to make and to use certain tools and instruments of various kinds to facilitate their work ; but that a delicate little bird, in want of almost every thing necessary for such an undertaking, with only its bill and claws, should know how to combine so much skill, regularity of form, and solidity of structure, is indeed surprising.

Take, for instance, the nest of a gold-finch. What can be more curious? The inside formed of cotton wool, the out of thick moss, and so contrived as to resemble the bark of the tree on which it is placed. In some nests the different materials are curiously interwoven together. Other birds (the black-bird) cement the parts together with moist clay, the inside being lined with hair and wool. The nests of swallows are differently constructed from the rest. They use neither straw nor sticks, but compose a sort of cement with which they make themselves nests both warm and convenient. But the nests most worthy of admiration are those of certain Indian birds which are suspended with great art from the branches of the trees, that they may be secure from the pursuit of several animals and insects. In general each kind of bird has a particular mode of building its habitation, some being fixed to houses, others to trees.

Such is the wonderful instinct of birds in the structure and deposition of their nests, that the power of the creative skill may

neither better nor worse than another, arriving at the perfection of their peculiar art in a few months, and exercising that art until the end of existence in precisely the same manner—the species being now what it was a thousand years ago,) contrast the results of human industry and invention, and the fruits of that perfectibility which characterizes both the species and the individual.

By man's intelligence (says the eloquent Cuvier) the animal creation has been tamed, conquered, subdued, reduced to slavery; by his labours marshes have been drained, rivers confined, their cataracts effaced, forests cleared, and the earth cultivated. He has not only executed, but has executed with the greatest possible accuracy the apparently impracticable task assigned him by the Poet—

“ Go, wondrous creature, mount where science guides,
Weigh air, measure earth, and calculate the tides.”

be traced in at once enabling, by a peculiar kind of instinct, the youngest pair of birds to build that nest which is best calculated for the propagation of its species.

“ Mark it well ; within, without ;
No tool had they which wrought, no knife to cut,
No nail to fix, no bodkin to insert,
No glue to join ; their little beaks were all,
And yet how neatly finished. What nice hand,
With every implement and means of art,
And twenty years apprenticeship to boot,
Could make me such another ? Fondly then
We boast of excellence, whose noblest skill
Instructive genus foils.”

Man has done this—mountains have been overcome, and the boundless ocean traversed, now forming as it were the great railway of the world. Thus have nations been united and a new world discovered, opening such a field for the uncorrupted energies of our race that the senses are dazzled and the mind confused by the grandeur and brightness of these interminable prospects, the thoughts that pass from time to mingle in the ocean of eternity. In this point of view man stands alone; his faculties and what he has effected by them place him at a boundless distance from the rest of the animal creation, at an interval no animal can fill up. Talk then no longer of the man-like monkey, the ourang-outang, or chattering chimpanzee;—disgust us not by any such comparisons, for they have all been weighed in the balance with man, and have all been found wanting:—and thus to compare man to the beast, is to insult that God after whose image he has been created.

“Say, why was man thus eminently raised
Amid the vast creation? Why empowered
Through life and death to cast his watchful eye
With thought beyond the limits of his frame?
But that the Omnipotent might send him forth
In sight of angels and approving worlds,
Might send him forth the sovereign good to learn,
To chase each meaner passion from his breast,
And through the storms of passion and of sense,
To hold straight on with constant heart and eye
Still fixed upon man’s everlasting palm,
The approving smile of heaven.”

In concluding this part of the argument let it ever be remembered, that in all our investigations, truth is to be regarded as the "pearl above all price." In this investigation our business has been to inquire what is true—not what would supply the best topics for elegant composition—for eloquent declamation, addressed to passion and to prejudice, instead of man's sober reason, strengthened by age and confirmed by experience. Let nothing be concealed. Truth, is like a beauty of our sea-encircled land, "more beauteous when unadorned" and seen in the open light of day; whenever it is thoroughly tried it will not fail to come like pure gold from the fire; like Ajax it requires nothing but daylight and fair play. Be it, then, the part of each to labour in supporting the final triumph of all truth, natural, moral, or intellectual, over all error, and thus contribute to hasten that glorious crisis destined doubtless one day to arrive, when truth, now cut and hewn like the mangled body of Osiris into ten thousand atoms and scattered to the winds of heaven, shall be collected limb to limb and moulded with every joint and member into an immortal feature of loveliness and perfection. And when our knowledge of these things is sufficiently matured, then will the mind be led to a far higher conception of the Divine Creator than we have at present the means of forming; then will it be drawn from the empire of prejudices and passions, and anchored only on the rock of truth. Dark, doubtless, will remain the brightest view our finite understanding can attain; for seeing ever in this transitory sphere "as through a glass darkly," we must with patience

await the dawning of that glorious future when the light of truth shall burst upon us in undiminished splendour, our mortal vision being purified and strengthened so as to sustain its dazzling brilliancy.

PART THE THIRD.

CHAPTER V.



COLLECTION OF SOME OF THE FACTS FROM WHICH THE CONCLUSION THAT THE VARIOUS RACES OF MEN CONSTITUTE ONE SPECIES HAS BEEN DRAWN, &c.

“They still may help to thicken other proofs.”

DURATION OF LIFE.

DR. RUSH informs us that the Indians of North America have at an earlier period than Europeans the marks of old age, “but this fact is to be traced to accidental circumstances.” Rheen, who is cited by Sheffer in his History of Spain, says, “the Laplanders not being subject to any dangerous diseases grow old; some live above a hundred years, but most to seventy, eighty, or ninety years, without becoming grey headed till they are very old.”

December 5th, 1830, died at S. Andrews, Jamaica, the property of Sir Edward Hyde East, Robert Lynch, a Negro slave in comfortable circumstances, who per-

fectly recollected the great earthquake in 1692, and also the person of Lieutenant Governor Sir H. Morgan, whose third and last governorship commenced in 1680, viz. 150 years before. Allowing for this early recollection the age of ten, this Negro must have been 160 when he died. Edwards informs us in his History of the West Indies, "that Negroes in these islands often attain to a great age." He mentions a Negress aged 120, and a second who was strong and healthy at 95.

Died at Kingston, Jamaica, Catherine Lopez, a Negro woman, at the age of 134.

The *Times* newspaper (October 2, 1823) says, "Died February 17, 1823, in the Bay of St. John's, Antigua, a black woman named Statira. She was a slave, and was hired as a day-labourer during the building of the gaol, and was present at the laying of the corner-stone, which ceremony took place one hundred and sixteen years ago. She also stated she was a grown up young woman when President Sharpe assumed the administration of the island, which was in 1706. Allowing her to have been fourteen years old at that time, we must conclude her age to be upwards of one hundred and thirty years."

Died October 12th, 1830, in Jamaica, aged 120, Jane Morgan, a Negro woman, formerly belonging to G. Crawford Ricketts, Esq., attorney-general of the island.

Patterson, in his Travels in Caffraria, on the authority of Mr. Barrow, states (and more recently Mr. Burchell) that Hottentots frequently exceed one hundred years. Many instances of considerable longevity in Africa are recorded by Winterbottom, Patterson, and Barrow. Dr. Prichard has collected an immense number of

instances (Vol. I. page 118-125.) Two things must be considered, the constitutional adaptation of the individual to the climate he inhabits, and the causes tending to shorten life. These causes, says Dr. B. Hawkins in his *Elements of Medical Statistics*, "operate with so much severity upon the enslaved population of the West Indies, that one Negro slave dies annually out of five or six; the mortality among the free blacks serving in the English army is about one in 33.3."

On Saturday Israel Furmen, an American Indian, who has attained the extraordinary age of 91 years, accompanied by his wife, a young woman of thirty-eight, and his child of three years old, applied to the lord mayor for relief. The old man said that he had been living in Wales, but had been compelled to leave the principality from having been obliged to join in Frost's treasonable outbreak; and having been examined as a witness in the case, he was driven away by the Chartists. He was driven to Bristol first, and then came to London. On applying for relief at the White-chapel workhouse, they put him to break stones, but because he was a quarter of an hour later than usual, they took from him the larger portion of his earnings. He wished, if possible, to get back to America.

After several questions had been asked of the old man, the Lord Mayor gave him a letter to the city of London Union, with a request that his case should be investigated.

The old man stated that he was the son of a chief, who had at first assisted the Americans in the war of independence, and afterwards joined the English. The

applicant was born in 1749. At fifteen years old he was apprenticed to a blacksmith in Philadelphia, and after he was out of his time he came to Europe, and visited France and Spain. He was at Bordeaux at the time that Louis XVI. was beheaded. Furmen went into the service of Colonel Burrows in 1793, and being on board the brig Polly, at Antigua, he was, in the following year, pressed into the English navy, and remained in the British service until 1816, having been during that period in the Bellerophon, Captain Cook, at Trafalgar, and was dreadfully wounded in that engagement; he was previously at Copenhagen, and at the taking of Flushing. He had twice been a French prisoner, and escaped to his ship. On his discharge he lived principally in Wales. He said his tribe in America were very long-lived, and that nine years ago, when he was 82 years old, he had a letter from his father, stating him to be alive and well. In order to prove his strength, the old man performed several difficult feats of agility, to the surprise of all present. —(June, 1840.)*

The proportionate duration of human life in different climates has of late engaged in the inquiry, the pens of many able men. It would here be superfluous to enter into the subject at greater length than is necessary to prove the comparative mortality in different countries, well shown in the following table of the celebrated M. Moreau de Jonnes. The returns belong to different periods.

* Globe Newspaper.

DIFFERENT COUNTRIES OF EUROPE.

In Sweden from	1821 to 1825....	1 death in	45
Denmark	1819 ... “ ...	“	45
Germany	1825 ... “ ...	“	45
Prussia	1821 to 1824....	“	39
Austrian Empire....	1825 to 1830....	“	43
Holland	1824 ... “ ...	“	40
England	1821 ... “ ...	“	58*
Great Britain	1800 to 1804....	“	47
France	1825 to 1827....	“	39.5
Canton de Vaud....	1824 ... “ ...	“	47
Lombardy	1827 to 1828....	“	31
Roman States.....	1829 ... “ ...	“	28
Scotland.....	1821 ... “ ...	“	50

Travelling towards the equator the mortality is found to increase, and of course the average duration of life to diminish. From the same work the following table is taken. Notice sur la Population des états de l'Europe, par M. Moreau de Jonnes. De l'Homme et de ses Facultés, par M. Quetelet.

PLACES.	LATITUDE.	ONE DEATH IN
Batavia	6° 10'	26 inhabitants.
Trinidad	10° 10'	27 “
Sainte-Lucie	13° 54'	27 “
Martinique	14° 44'	28 “
Guadaloupe	15° 59'	27 “
Bombay	18° 36'	20 “
Havanna	23° 11'	33 “

* This must be an error. The deaths in England, according to Potter and Rickman, from 1821 to 1831 are 1 in 55 inhabitants.

Table showing the comparative mortality between the natives and foreigners in the following countries:—

PLACE.	OF WHAT COUNTRY.	PROPORTION OF DEATHS.
Batavia, 1805	{ Europeans	1 in 11
	{ Slaves	1 " 13
	{ Chinese	1 " 29
	{ Javanese or Natives	1 " 40
Bombay, 1815	{ Europeans	1 " 18.5
	{ Mussulmen	1 " 17.5
	{ Parsees	1 " 40
Guadaloupe, 1811 to 1824	{ Whites.....	1 " 22.5
	{ Free Men of Colour	1 " 35
Grenada, 1815	{ Whites.....	1 " 24
	{ Free Men of Colour	1 " 23
	{ Slaves	1 " 22

I have not before me facts sufficient for answering the question, what is the proportion of centenarians? From the London bills of mortality, it was calculated that one individual in 3,126 reaches his hundredth year. In 1751 the number of deaths was 21,028; in this number fifty-eight persons had reached 90, thirteen 100, one 109; giving one centenarian to 1,617. From 1728 to 1758, a period of thirty years, the number of deaths in the bills of mortality amounted to 750,322, and out of this number forty-two persons had exceeded the hundredth year. M. Quetelet calculates that out of ten thousand births the age of ninety is attained by 682; and the age of one hundred by ten only. Many instances of very advanced ages may be

collected from a curious work by Mr. Easton, of Salisbury, from which the following are extracted :—

NAME.	YEAR OF THEIR DEATH.	AGE.
Apollonius of Thyana, in A. D.	99	... 140
St. Patrick.....	491	... 122
Attila	500	... 124
Piastus, King of Poland	861	... 120
Thomas Parr.....	1635	... 152
Henry Jenkins	1670	... 169
The Countess of Desmond....	1612	... 145
Peter Tornton	1724	... 185
Margaret Patten	1739	... 137
John Rovin and his Wife.....	1741	... 172 and 164

In addition to these others may be quoted, as Thales, who reached his 90th year. Anaxagoras, 72. Plato, 81. Xenocrates, 82. Epicurus, 73. Pyrrho, 90. Democritus, 100. Bacon reached his 64th year. Galileo, 70. Harvey, 88. Boyle, 55. Leibnitz, 70. Newton, 84. Boerhaave, 69. Linnæus, 71. Davy died comparatively young. The average duration of life is in favour of the ancients.

Instances of very advanced age may also be found beyond the confines of Europe. It is interesting in connexion with this subject to remark the wide interval which separates mankind from that class of brutes said to be allied to them in physical structure. Of all the Simiæ, of the whole tribe of Orangs and Troglodyte, I now speak, and on the authority of M. Lesson, who has taken every care to investigate the physical history

of the monkey race, it may be stated that the longest term reached by the chimpanzee is about thirty years.

II. VARIETIES IN THE COLOUR OF THE HAIR AND SKIN.

Albinos have been already noticed, and proved far from uncommon. They are well known in Java, Ceylon, and other neighbouring islands. White Negroes are frequently born among the black races of Africa. Dr. Winterbottom relates several instances from his own observation. Buffon minutely describes a white Negress born in the island of St. Dominica. Dr. Winterbottom also mentions a man who though born of Negro parents, was of a Mulatto complexion and much freckled, and who had strong red hair disposed in very small wiry curls over the whole of the head; he also adds, "I saw a Mulatto man belonging to the Kroo Coast, whose hair was a pale red, such as occurs in England." Marcgraf (*Tractatus Basiliæ*, p. 12, quoted by Blumenbach, p. 182, and by Prichard, p. 229) saw in the Brazils an African woman whose hair and skin were red. In the second volume of Dr. Goldsmith's *History of the Earth and of Animated Nature*, he describes a white Negro whom he saw exhibited in London. "Upon examining this Negro I found the skin to be in colour exactly like an European; the visage white and ruddy, and the lips of the proper redness; there were sufficient marks to convince me of his descent; the hair was white and woolly, and very unlike any thing I had seen before. The iris of

the eye was yellow, inclining to red; the nose was flat, exactly resembling that of a Negro, and the lips thick and prominent." Both Groben and Blumenbach state, that individuals are born with red hair among the Negroes of Congo. In all races of dark complexion, says Dr. Prichard, the Xanthous variety occasionally springs up. In the island of Otaha, Dr. Foster says, he saw one man with a complexion much lighter than the rest. He had red hair. Mr. Burchell also saw an individual of the Xanthous variety born from the race of black Kaffers. "When I saw her she was sixteen years old, stout and of short stature; the colour of her skin was that of the fairest European, or, more truly speaking, pink and white—a compound of pure white, with a moderate tint of vermillion, without the admixture of any other colour. Her features, however, were those of a genuine Caffer."

Negro children, says Dr. Winterbottom, "are nearly as fair as Europeans at birth, and do not acquire their colour until several days have elapsed. The eyes of Negro children are also of a light colour, and preserve somewhat of a blueish tinge for several days after birth." Camper had an opportunity of observing the changes in a Negro child born at Amsterdam. "It was at first reddish like an European; on the third day the folds of skin round the nails and the areolæ of the breasts were quite black. The blackness extended over the whole of the body in five or six days."

Camper dissected at Groningen a young woman in whom he found the face, arms, and legs, of a snowy whiteness; the other part of the body black.

III. VARIETIES IN THE FORMATION OF THE SKULL AND BRAIN, &c. &c. &c.

TABLE EXHIBITING THE WEIGHT OF SEVERAL SKULLS
NEARLY OF THE SAME SIZE.

	lb. oz.
Skull of a Greek	1 11½
Of a Mulatto.....	2 10
Negro 1.....	2 0
Negro 2.....	1 12½
Negro 3.....	1 5¼
Negro 4. (from Congo)	1 11¾
New Zealander	1 10¾
Chinese	1 7½
Gipsey without lower jaw.....	1 13½
Gipsey with lower jaw	

It would appear therefore, says Dr. Prichard, that there is little constant difference.

The testimony of many writers may be added to prove that the black and woolly-haired inhabitants of Africa have frequently beautiful features, and scarcely differ in form from the European nations. Again, on the other hand, it may be remarked, that individuals are frequently seen among other nations who strongly resemble the more characteristic form of the African, and that examples might easily be found in which all the peculiarities of the Negro countenance are present. The fact is mentioned by Dr. Prichard, and Soemmerring has cited Loder, who describes the skull of a Thuringian as affording the characteristics of the

African race in a native of Europe, and sprung from European parents.

The two great peculiarities of the Negro skull consist in the lateral compression or narrowing of the entire cranium, and great forward projection of the jaws. The head is narrow in proportion, and the upper jaw protruded. Soemmering, White, and many others, have pretended to point out numerous points of relation between the skulls of Negroes and Apes. The Negro has the narrowest and most elongated of all human skulls, and therefore as the crania of apes and all other animals of the monkey tribe are much narrower and longer than the crania of Europeans, it follows that there is some slight resemblance. But the researches of Professor Owen prove that the points of distinction between the skulls of Negroes and the anthropoid apes, classed under the two sub-genera, Troglodytes and Pithecus, are much greater than was supposed. Their cranium is in fact nothing more than a rounded case of bone *altogether posterior to and not above the face*. The facial angle contains, according to Professor Camper's tables, 80° in the heads of Europeans; in some skulls it is much less, and has been found in Negroes only 70°. In the Ourang it has been estimated at 64°, 63°, 60°. This is incorrect; it is the measurement of the skulls of young apes. Professor Owen gives the facial angle of the adult Troglodyte as only 35°, that of the Ourang or Satyr only 30°. The Peruvian cranium described by Tiedeman, says Professor Scouler, "possesses so very remarkable a configuration, that we should be tempted to adopt his opinion, that it belonged to an original and primitive

race, if we were certain that its form had not been produced by artificial means." I am aware that the possibility of deforming the cranium by the application of continued pressure has been doubted by able anatomists, but it is unnecessary to examine their reasonings in a case where we can appeal to facts. That the Caribs of St. Vincent flattened the heads of their children is well known, and the inspection of Blumenbach's engraving of a Carribean skull will convince any one of the great amount of deformity which may be produced. Among the Columbian tribes the child immediately after birth is put into a cradle of a peculiar construction, and pressure is applied to the forehead and occiput. After the head has been compressed for several months, it exhibits a most hideous appearance; the antero-posterior diameter is the smallest, while the breadth from side to side is enormous, thus reversing the natural measurements of the cranium. As the individual advances in years the deformity becomes less, but even in the adult it is very great, and from the excessive depression of the forehead the eyes appear as if turned upwards, a circumstance which gives a very marked physiognomy to the Indian. These circumstances clearly establish the fact that the skull is altered by artificial means.

In drawing the conclusion that the formation of the skull of the Negro is very inferior to the European, anatomists appear to have set out with the intention of collecting facts to strengthen the established opinion, and have therefore examined the crania of Negroes in European Museums, forgetting that such skulls do not present the true character of this race: they have been

taken from unfortunate creatures kidnapped on the coast, or their enslaved offspring, and from skulls of this description the proportional measurements of Soemmering were taken. Two questions now arise that it will be very important to answer. 1. Is there any difference of an essential nature between the brain of a Negro and an European? 2. Has the brain of the Negro any greater resemblance to the brain of the Chimpanzee than has the European? It will be necessary to look at the question in all its bearings—to take as our guide the formation of the crania of the whole race, and not the crania of particular Museums. What city, hamlet, or village, in this country would not furnish to the collector, skulls which might in the same way be taken and exhibited in some distant country as the characteristic marks of the head in England, and yet be mere exceptions to the general rule? The opinion of Aristotle, who supposed the brain of man both absolutely and relatively to be larger than other animals, is liable to some exceptions, which, however, are not numerous. The elephant and the whale alone have brains absolutely larger than the human, which considerably exceeds in weight the brain of animals much larger in structure. The canary, sparrow, and many small birds have brains larger in proportion to the size of their bodies than man.

The valuable and extensive researches of M. Tiedeman have led to the following conclusions:—1. That the common opinion of the brain diminishing in old age is not supported by evidence. (The author of this work has dissected the brains of numerous individuals of all ages—many at a very advanced period of life—and

never found any reason for supposing that the mass of the brain diminishes with age.) 2. The average weight of the European brain arriving at maturity about the eighth year is from 3lb. 3oz. troy weight to 4lb. 6oz. 3. Forty-one instances display the capacity of the cavity of the cranium in Negroes. Seventy-seven similar measurements of male European skulls are added; twenty-four of male Asiatics (Caucasian race); twelve of female Europeans; twenty of the skulls of the Mongolian, and twenty-seven of the American race; and forty-three of the Malagar and Polynesian nations, in which Australians are included. From this extensive examination Tiedeman says, "I am enabled to state that the cavity of the skull in the Negro is in general in no degree smaller than that of the European, and therefore the opinion of many naturalists, as Camper, Soemmering, Cuvier, Lawrence, and Virey, who maintain that the Negro has a smaller brain than the European, is ill-founded and entirely refuted by my researches." His measurements of the medulla oblongata and spinal chord prove that there is no distinguishable difference between these parts in the Negro and the European. To these questions adds Dr. Prichard, "we are enabled to obtain the most satisfactory solutions."

It appears, then, argues the author just quoted, that there is nothing whatever in the organization of the brain of the Negro, which affords a presumption of inferior endowment of intellectual or moral faculties. If it is contended that the African families are inferior to the rest of mankind on the ground of historical facts, and because they may not perhaps have contributed

their share to the advancement of science, manufactures, or the fine arts, we have, says Prichard, "the example of the Egyptians to oppose to such a conclusion, and this will be quite sufficient if we *may be allowed to reckon the Egyptians* as a native African tribe." It is true that they have not contributed to the advancement of human art and improvement, but they have proved themselves both able and willing to profit by these advantages when introduced among them. They also have listened "to the voice of the preacher,"—they have compared the ancient worship of idols with the simple truths of Christianity, and in embracing the latter, they have exercised that attribute peculiar to man, reason—"Bel boweth down, and Nebo stoopeth," because the savage, by the exercise of his mental powers, has been convinced of the error of the faith of his fathers.

IV. PHYSICAL CHARACTER OF THE EGYPTIANS.

Professors Heeren, R. Ottfried Muller, and also Dr. Prichard, mention some curious facts, proving that the Egyptians, though of a brown or dusky complexion, were not really black, and also that considerable difference existed among them in the colour of their skin. Two documents have lately come to light, in the shape of an old Egyptian contract, and an interpretation given by Professor Boeckh and M. H. S. Martin. They belong to the Ptolemaic period, but the names of the persons mentioned indicate them to be native Egyptians. The persons entering into the contract

are singularly described according to their form and colour. The seller, whose name is *Pamonthes*, is termed *μελαγχρως*, and the buyer *μελιχρως*, which has been translated "of a black," also "of a dark brown," and lastly "of a yellow or honey-colour." This M.S. is at Berlin. In the other which is at Paris the same epithet is applied to the buyer who is named Osarreres. Without criticising too severely the exact rendering of the word *μελαγχρως*, it is clear that a difference of colour existed in the parties bound by this contract, sufficiently great to make it the mark by which both could be described, and from this it follows that considerable diversity in figure and complexion existed among the ancient Egyptians. Humbolt describes a white race; but although he speaks as if it were distinct from the rest of the community, Dr. Prichard thinks it probable that in Egypt as in other countries the higher classes were fairer than the common people, Muller has contended in favour of this conclusion still more strongly; perhaps more strongly than is warranted by the knowledge we possess. If this examination is extended to the remains of painting and sculpture, an idea may be formed of the colour of their complexion. The paintings found in their temples and magnificently decorated tombs, in some of which the colours are known to be preserved in a fresh state, prove that this people were red or copper-coloured, and much resembled the Fellah* and

* Called also *Moslem-Egyptians*; a mixed race, between the *Copts* and *Arabs*, well described by my friend Mr. Lane.—(Mod. Egypt. p. 32.)

Kafir tribes now existing in Africa. This colour was remarked by Belzoni, and is mentioned by him at the two hundred and thirty-ninth page of his Travels. Female figures are sometimes distinguished by a yellow or tawny colour. In the Travels of Denon (translated by Aikin) he thus describes these paintings:—"In delineating the character of the human figure, the Egyptians, being unaccustomed to borrow from other nations, could only copy their own figure, which is delicate and strong. The female forms, however, resembled the figures of beautiful women of the present day, round and voluptuous; a small nose, the eyes long, half shut, and turned up at the outer angle, like those of all persons whose sight is habitually fatigued by the burning sun or the dazzling whiteness of snow; the cheeks round and rather thick; the mouth large, but cheerful and smiling; displaying in short the African character, of which the Negro is perhaps the original type."

In the opinion of Blumenbach, there are three varieties in the physiognomy expressed in their paintings and sculptures, or three principal types to which individual figures, though with more or less deviation, may be reduced, viz.—the Indian, the Ethiopian, and the Berberine. If the Copts are examined (said to be the representatives of the old Egyptians) varieties may also be observed: be it remembered that this country has undergone many conquests, and from each of these may have received additions to its former stock of inhabitants. Among the modern Copts Volney remarked a certain approximation to the Negro. Baron Larrey describes them "of a full countenance, with a

long aperture of the eyelids (*coupés en amande*), projecting cheek bones, hair and beard crisp, and of a black colour, dilated nostrils and thick lips." It appears their general complexion is a dusky yellow, though we have the authority of Belzoni for asserting that some are "as fair as Europeans."

V. LANGUAGES, POWER OF SPEECH, &c.

After collecting an immense mass of evidence, Dr. Prichard thus concludes his argument as to the origin of languages:—"It is sufficient for my purpose to remark that the Hebrews, and the Chaldeans, and the Hindoos, whose archives will be allowed to reach with much greater certainty, and in a much more intelligible form, into the early ages of the world than those which any other nation can exhibit, give this declaration of their common declaration. Yet having thus originated from a common source, we find them at the end of a thousand years, separate nations, speaking languages scarcely less diverse than is that of either race when compared with the idiom of the Egyptians. If my readers are willing to allow a sufficient weight to these considerations, and I think they cannot refuse to do so, without rejecting in a mass all the historical tradition of the primeval world, it will be evident that no insuperable difficulty will remain in accounting for the near connexion in manners, customs, religion, and other characteristics, of those branches of mankind, which have preserved indications of early connexions, or affinity, though separated into distinct nations, at a period of the world which preceded the discrimination

of languages. To express this argument in few words, if the Goths, the Hindoos, the Greeks, and Latins, originally speaking one language, had so far diversified their speech as they must be allowed to have done fifteen centuries before the Christian era, the diversifying influence may within nearly an equal period of time have given rise to differences even so great as those which exist between the Semitic and Indian languages." The learned writer quoted above does not enter into an examination of the biblical account of the confusion of languages, but he finds no difficulty in admitting its truth, nor can any reasonable being doubt the possibility of a supernatural event taking place in an age, and at a period when the course of nature must have been at times widely deviated from.

2. Language peculiar to man. It has been contended that animals have not the power of speaking, because their organs of speech are imperfect. This is nonsense; the tongue of an ape is as perfect as that of a man, and this assertion either has been made in ignorance of the structure of the organ, or in direct opposition to the known facts bearing upon the case. Who can listen to the notes of the lark, or the warbling of the nightingale, and say that this organ of song is imperfect? Language may be divided into the language of speech and the language of song. Birds possess the latter—they possess the former also in a limited degree. They can repeat words that have been taught to them, or imitate the notes of other birds. The power of imitating the notes of the feathery inhabitants of the American forests is possessed in an extraordinary degree by one of the thrush tribe—the

turdus polyglottus, or mocking-bird. A parrot of the grey kind arrived at Windsor Castle, on Wednesday afternoon (December, 1840), which has been purchased by Prince Albert for fifty pounds of Mr. Shepherd, of the City Road. It is a perfect master of 800 words in the English language, and has only been in this country fifteen months. The bird sings with great apparent feeling the first verse of "The flag that braved a thousand years the battle and the breeze," and likewise sings with considerable humour the first verse of "Jem Crow." Allowing some little for the imagination of the writer for the Globe Newspaper, from which the above account was taken, there can be no doubt the bird possesses the power of articulating words sufficiently, to prove that a want of speech depends not upon any defect in the formation of the tongue. This parrot, however, simply echoes the words heard from time to time, like any other machine; without understanding a word that is uttered, or why made use of. Language, as before stated, implies a power of thought, an exercise of reason, and therefore animals have not the power of conveying by words their ideas, or holding communication with their fellows by words, by that peculiar gift of speech which man and man only possesses.

VI. MAN DISTINGUISHED FROM THE INFERIOR TRIBES OF ANIMALS IN THE FORMATION OF HIS FRAME.

In drawing a comparison between the formation of man and the inferior tribes of animals, his erect stature

is a most remarkable feature of difference. No race, no tribe, no individual of our species in a condition of health, has been known to walk except in the upright position, and this distinction is very remarkable, at once presenting a difference no reasonable individual can deny; nevertheless it has been denied as peculiar to man by some of that genus of philosophers, who argue also that man was in the beginning furnished with a tail; having got rid of this disagreeable appendage, the desire, it is contended, arose to walk erect, and not to crawl as our first parents were wont upon their hands and feet. Whilst such arguments are used truly the remark is justified, "*Nihil tam absurdum esse, quod non ab aliquo philosopho dictum fuit.*"

If, contends Mr. Lawrence, "the erect attitude and biped progression be peculiar to man, the structure of the lower limbs which support his trunk and of the muscles which move it, must exhibit characters of form, size, and arrangement, which are met with in no other animal;" and this is found to be the case. The disproportionate length of the upper and lower limbs clearly points out the office each was intended to fulfil. This is not the case in any of the monkey tribe, and such a disproportion at once proves that they were not intended to walk erect. In examining the bones of the hands and feet in man, the bones of the latter become perfect at a much earlier period than the former, because the hand at an early period of infancy is of little use, but the feet in ten and twelve months after birth sustain the weight of the body. The legs are so connected with the trunk as to admit of wider separation than in any other animal, and thus man is enabled to

derive every support from the feet. No piece of mechanism is more perfect than the foot. The size of the os calcis, and its posterior protuberance in which the muscles of the calf are inserted, prove it an infallible characteristic of man. "Ex calce hominem, ex pede Herculem." Space and protection are supplied to the muscles, arteries, veins, and nerves, by the concavity of the sole, and from their being covered with a thick integument under which is placed a quantity of granular fat: by this simple and beautiful organization these important parts are protected when the foot is placed in contact with the ground; this peculiarity of structure when compared with the hand clearly points out the use for which each has been intended. A comparison of the chimpanzee, ourang, or any of the monkey tribe, with man in this respect, proves that the foot in such animals resembles a hand—it rests upon the outer edge—the heel does not approach the earth—and the tarsus is contracted. The examination of the various muscular fibres are also conclusive on this point. Aristotle remarks, "the calves of the legs can only be ascribed to the human race." The whole formation of the thorax is also adapted to the erect position; in fact, if the skeleton of a monkey is compared with that of a man, the latter will be seen well fitted to move onward in the manner peculiar to our species; whilst the former evinces that the erect position is not natural to them, but artificial, and can never be any thing but unsteady, painful, and irksome; nor can it be necessary to state, that when monkeys are seen walking in an upright position, the circumstance is to be traced to discipline and instruction, and the first glance convinces the mind that

such a position is unnatural; the narrowness of the pelvis, the angle of the thigh in connexion with the trunk, the want of muscles to form calves, and the formation of the foot, prove such a position to be unsuitable. No proof has ever been adduced of an ape or any animal, save man, supporting his body upon one foot only. This fact is easily accounted for in the great breadth of his feet and in the power of the lower limbs. Monkeys cannot do this; they go, says Daubenton, "almost erect on the feet, but the legs and thighs are bent, and sometimes the fore-paw touches the ground, to support the reeling body; they are unsteady if any attempt is made to stoop in the upright position; the heel only rests upon the ground, the sole of the foot being raised; they can remain but a short time in this position, which appears very unnatural." These, and other proofs which might be given, render it certain that the erect posture is peculiar to man, nor can this beautiful formation of his frame in comparison with animals, and more particularly the monkey tribe, be attentively examined without coming to such a conclusion. The opinion of Linnæus ("*dari simias erecto corpore binis æque ac homo pedibus incedentes et pedum et manuum ministerio humanam referentes speciem*") and others, who have asserted that monkeys can walk in this posture as well as, and in common with man, is unsupported by a shadow of probable testimony, and it would be a waste of time to combat arguments and fanciful theories at once fully answered by the Book of Nature, to whose page the inquirer is referred.

In comparing the diseases of men and animals, it is

found that certain of them are peculiar to man, and affect every race of men alike. Scarlatina, variola, epistaxis, nervous affections, nostalgia, cretinismus, and cancer. The two kinds of lice with which our species are affected, have not, as far as we know, been found in any other animal. Without entering into a more lengthened investigation of the other points of difference, they may be summed up in the following table.

Man differs from every other animal—

I. In his feeble and long infancy, late puberty, and slow growth.

II. Smoothness of skin, and want of natural weapons of offence or defence.

III. In the general conformation of the body; the structure of the thighs and legs; the erect posture; the adaptation of certain muscles to that state; the peculiar formation of the feet; the position of the eyes; the possession of two hands, beautifully and perfectly constructed, and in the great strength of the thumb in comparison with the monkey race.

IV. Large proportion of the cavity of the cranium to the face.

V. In the power he possesses of living upon every kind of food, and of existing in all countries and in all climates.

VI. In being gifted with speech. Holding communion with his fellow men by words.

VII. In having teeth all of the same length, the inferior incisors being approximated.

VIII. Want of the intermaxillary bone; shortness of the lower jaw; in the shape of the head and its

articulation to the spinal column by the centre of its basis ; no ligamentum nuchæ.

IX. Great size of the brain in proportion to the nerves which arise from it ; large size of the cerebral hemispheres.

X. In being the victim of certain diseases common only to man.

XI. In the length of his life, in comparison with monkeys.

XII.* In the possession of an immortal and immaterial soul.

For the sake of avoiding controversy and conciliating certain critics, it was suggested by a friend that the last point of distinction had better have been left out. If man, however, possesses this peculiar attribute—if some part of his body be the seat of an immortal soul—or rather if an immortal essence pervades the whole of it—why should this point of distinction not be conceded ? *Because its existence cannot be demonstrated.* Two questions naturally present themselves, what is mind, and what is matter ? To reply to these queries involves inquiries of much difficulty, and uncertain utility, and to attempt to examine either metaphysically would perhaps be out of character with the object of this work. Indeed to venture to form a conclusion, as to the real nature of either mind or matter, displays

* Some writers admit the beast to possess an immortal mind ; without staying to examine their arguments, the answer of Scripture, "the beast that perisheth," is conclusive.

only that presumption which has always distinguished attempts to resolve problems which from their nature appear placed beyond the reach of human reason, and enveloped in clouds that the mortal eye of man cannot pierce. If the attempt to describe matter is made, it cannot be proved that we have a positive perception of substance; but the eye discovers certain properties which the mind recognizes, under the terms extension, colour, figure, and solidity, "and this (as Dr. Reid expresses himself) from the constitution of our nature leads us to refer to something which is *extended, figured, and coloured.*" In the same way, although there is no direct evidence of the existence of mind, yet there exists a consciousness of sensation, thought, and volition, and this at least implies the existence of something which feels, thinks, and wills. Every man knows that his sensations, thoughts, and volitions, belong to a part of himself, which is distinct from his body; for if he lose a leg, or a finger, or both; or both his legs and both his arms; this feeling, thinking, and reasoning part of his being is as vigorous as ever. He has, therefore, a clear demonstration that it is not a material substance, nor the result of material organization, since it is not liable to be injured or changed by the loss or mutilation of many of his organs, nor even when his nervous system is deranged. The evidence of as strong a proof of the existence of mind as body may, however, be denied, but a little reflection proves such a supposition to be an error; for, to use the elegant language of Dugald Stewart, "the one is suggested to us by the objects of our consciousness, and the other merely by the objects of our perceptions."

If this reasoning is correct, the establishment of the distinction between mind and matter, is based upon no metaphysical quiddities; the notions concerning both being merely relative, the existence of body and matter is only known by such sensible qualities as extension, figure, and solidity; that of mind by such operations as sensation, thought, and volition, and both are known only by qualities and attributes, of the which little is known, and of the minute essence of either, the most lamentable ignorance must be pleaded. Be it remembered, that the connexion, to a certain extent, of mind with matter has not been denied, and a very brief examination will suffice to prove its powerful influence over the functions of the body. No better illustration has been given of this important connexion than in the comparison of the soul with the body, by the clever author of *Tristram Shandy*, "to a coat with its lining," "if you rumple the one, you rumple the other." This influence is exerted according to the nature of the passions, and may be divided into two classes, the depressing and the exciting, and it is necessary to be aware of the nature and influence of both on the system of a patient, not only at the time the surgeon or physician is about to prescribe for him, but in observing the effects of medicines on the body.

Vexation disturbs the functions of the stomach, alters the secretion of the gastric juice, impairs digestion, and builds the foundation of many dyspeptic complaints.

Sorrow, by weakening the energy of the nervous system, impedes all the secretions. The rest becomes disturbed, the appetite diminishes, the circulation

through the lungs is impeded, flatulence, colic, and spasm, are types of the altered condition of the stomach, and the jaundiced countenance of the sufferer shows that the liver is also affected.

Fear paralyzes the muscular powers of the body, weakens and even arrests the action of the heart. Terror, which is an excess of fear, acts so powerfully as to impair the secretion of milk sufficiently in the mother to render it injurious as food for her child. Dr. A. T. Thompson relates the effects of fear upon a lady. Her husband, an officer in the army in the last stage of consumption, was advised to sell his commission, as the only means of providing for his wife and family. Day by day in the hope, that to-morrow would cause the sun of health to shine upon him, he continued to delay;—at last the deed was executed, he appeared better, and was left by the doctor sitting up in his bed. In one short hour he was recalled;—the patient was dead;—beside him stood the wife, deprived of feeling, dead to sensation, in a state technically termed *ecstasis*, inanimate as a statue, living, it is true, yet stiff, and rigid as a corpse.

“Mute, motionless, and stiff, a monument of grief.”

She continued in this condition for two days. Reason long tottered on her throne, and it was many months ere this lady was restored to health.

Joy, on the other hand, at times so powerfully exhausts the brain and nervous energy as to produce death. The classical reader at once remembers the unhappy fate of poor old Sophocles, who died with

delight on being crowned for composing a successful tragedy in his old age ; also that of Chilo, of Lacedæmon, who whilst embracing his son when declared victor in the Olympic games died in his arms ; and also the stories of the Roman ladies, who expired on seeing their sons return from the battles of Thrasymenus and Cannæ. But to examine facts nearer home. Doctor Mead says that during the never to be forgotten year of the South Sea bubble, more individuals when they had acquired large fortunes went mad, than others who were ruined by that system of fraud.

Confidence acts as a tonic, and this depends much upon the respect in which the physician is held. It was a belief of this kind that induced the woman to touch the hem of our Saviour's garment ; and it is this feeling which is so well described in Scripture, "Thy faith hath made thee whole."

Imagination has a direct influence over the corporeal functions. Hence the thought of some favourite dish causes the "mouth to water," and from this fact in physiology, doubtless is derived the old saying, "the clash of knives and forks is music to the ears of a hungry man." The power of the mind over the body may be also illustrated in the disease called nostalgia, or home-sickness, to which the Swiss and Scotch are so subject. My friend* Mr. Carrick, of Kensington,

* The Alpine horn is an instrument constructed with the bark of the cherry-tree, and which, like a speaking-trumpet, is used to convey sounds to a great distance. When the last rays of the sun gild the summit of the Alps, the shepherd who dwells

many years a surgeon in the Royal Navy, had frequent opportunities of witnessing this disease. He says they get dull; will not eat; cannot sleep, or if they do so, dream but of friends and home; the disease is daily on the increase; there is but one cure—put them into a homeward bound bark, and let them tread once more their native shore. This effect is also produced by disappointments in love; the female form cannot endure the worm that feeds upon “the damask cheek”—

“She pin’d in thought,
And with a green and yellow melancholy,
Sat like patience on a monument
Smiling at grief.”

The concealment of her passion, brooding among the ruins of her peace, produces a mental anguish under

highest on those mountains takes his horn, and calls aloud, “Praised be the Lord!” As soon as it is heard, the neighbouring shepherds leave their huts, and repeat these words. The sounds last many minutes; for every echo of the mountains and grottoes of the rocks repeat the name of God! How solemn the scene! Imagination cannot picture any thing more sublime. The profound silence that succeeds—the sight of those stupendous mountains, upon which the vault of heaven seems to rest—every thing excites them to enthusiasm. In the meanwhile, the shepherds bend their knees, and pray in the open air, and soon after retire to their huts, to enjoy the repose of innocence. The disease mentioned by Mr. Carrick is frequently produced among the Swiss by playing upon this horn the air “Ranz des Vaches;” so fearful is the effect of imagination upon them, that nothing but returning home can prolong existence.

which the body soon sinks. This intense grief gradually undermines the constitution, the bodily powers fail, and the victim of the influence of moral causes on the corporeal functions rests from her sorrows in the grave. Such are the effects of the mind upon the body. The existence of the latter is made evident from the constitution of our nature leading us to refer to something which is extended, figured, and coloured; the existence of the former is proved by the operation of such sensations as *thought* and *volition*.

VII. VARIETIES IN THE LOWER ANIMALS, SIMILAR TO WHAT ARE OBSERVED IN MAN.

White mice afford an example of the Albino variety. Examples of this variety are also afforded in white elephants mentioned by Ælian. He also informs us that Eubœa was celebrated for its breed of white oxen; it was termed *Αργυβοεια*. The buffalo, roe, camel, rhinoceros, and stag, also furnish examples of the Leucous variety. Many birds, as peacocks, crows, blackbirds, fowls, and partridges, have feathers of a pure white colour and red eyes.

Black animals with black hair and dark skins, as horses, pigs, rabbits, sheep, and oxen, furnish a resemblance to the dark or Negro races of men.

The chesnut horse, with brown mane and tail, is a good illustration of the Xanthous complexion in mankind. The river Xanthous is said by Ælian to have derived its name from the yellow colour of the fleeces of the sheep fed upon its banks, the ancients fancying it rendered the wool yellow. Dr. F. Buchanan, in his

“Journey in Mysore,” asserts “there are three varieties of colour in the sheep; they are red, black, and white, and these are not distinct breeds.” This kind of comparison, it is contended by Dr. Prichard, between the varieties of colour “in mankind, and those which occur in warm blooded animals, is complete as regards the colour of the hair.” “The melanocomous races of men are analogous to animals with black hair; those of the Xanthous variety, to light brown, bay, or yellow coloured animals; and the Albinos in the human kind to white-haired animals with red eyes, which are well known.”

VIII. EFFECTS OF CLIMATE IN CAUSING VARIETIES IN THE COLOUR OF THE SKIN, &c. &c. IN THE DIFFERENT RACES OF MEN.

The advocates for attributing to changes of climate the difference in colour, form, and stature, observed among the families of the earth, on the one hand, appear to have given greater influence to the operations of temperature than is warranted by facts; on the other, writers who deny the influence of climate altogether sink into the opposite extreme. The effects of temperature in determining the form and colour of plants is very remarkable. If a wild flowering plant is taken into the garden, protected from the frost, and carefully watered, a change is observed to take place in its form, habit, and size; and if this plant be removed to the greenhouse, a still warmer temperature, the colour of the flower becomes blanced, white, and

faded. The scale of atmospherical heat is that which ordinarily determines the nature of vegetation. Hence under the burning rays of the Torrid Zone, it is only necessary to ascend some of the high mountains which are found in these latitudes, to a certain elevation, and the plants of Temperate Zones are found growing in great luxuriance. The low valleys of the Andes, towards the equator, produce the palm-tree, and the more lofty parts of the chain, the oak and other forest trees. From an altitude of about 15,000 feet above the level of the sea, to the boundary of perpetual snow, lichens are the only plants visible. Similar gradations may be observed on the Alps, on ascending which, beeches, chesnuts, and oaks occur in succession, the latter gradually becoming stunted, that is, of *shorter stature*, till they disappear not far distant from the perpetual snow line. The vegetation of the Torrid Zone appears marked by a wealth and grandeur impossible to be described by the pen of an European. "On the barren flank of a rock (says Humboldt in the fourth volume of his personal narrative) grows a tree with coriaceous and dry leaves. Its large woody roots can hardly penetrate the stony soil. During many months of the year not a single shower refreshes its foliage. Its branches appear dead and dried; but when the trunk is pierced there flows from it a sweet and nourishing milk. It is at the rising of the sun that this cow tree, this milky fountain, is most abundant. The natives are then seen hastening from all quarters furnished with large bowls to receive the milk." Any large mountain in a warm climate will furnish examples of the vegetable zones, arising according to the temperature re-

quired for their support. Thus the volcano of Teneriffe, one of the Canary Islands (N. latitude $28\frac{1}{2}^{\circ}$) furnishes five of these bands or zones.

- I. The region of Vines.
- II. of Laurels.
- III. of Pines.
- IV. of the Retama (a kind of Alpine Broom.)
- V. of Grasses.

These belts are arranged in stages, one above the other, and occupy a perpendicular height on the declivity of the peak of 11,200 feet.

The above facts prove that the same plant becomes altered in form and stature in different climates. The vegetable tribes are dispersed over every portion of the earth; even perpetual snow is the abode of a red dust, which has been proved a vegetable production. But this dispersion has not been the result of a blind or unmeaning chance: the Torrid Zone contains the most juicy fruits, and the most powerful aromatics; and the same wisdom which first called them into being, in such beautiful and harmonious forms; the same hand which gave to them their odour, colour, and pencilled spots, has also fixed laws for their proper distribution over the surface of the earth.

It has been supposed, that the colour of the Negro is produced by their labouring continually under a species of black jaundice. Every opinion is at least entitled to a careful examination, and it is difficult to suppose that men of talent and education would adopt such a conclusion without some grounds for so doing;

the mind is therefore prepared to find a slight degree of truth, mixed with a mass of falsehood. It is an assertion so evidently absurd, that the contradiction seems hardly to be required. It cannot be supposed that whole nations could exist in a state of robust health and vigour under the influence of a disease of this kind. If this black colour is the effect of a diseased liver, produced by the sun's rays, why do not Europeans become black after remaining some years in Africa; or why do not Negro children continue (for they are born so) white in this country? The obvious solution of the above questions sets the matter at rest.

The external tegumentary membranes, as their name implies (*tegere*, to cover) encase the whole body. The skin is composed of three parts or layers, called the corium, rete-mucosum, and cuticle. The *corium* (true skin, *δερμα*) forms the greater portion of this case, and being the principal part, is much thicker than the others, and gives support, as it is subjacent to them. The corium when examined by itself is pale, or of a dull white, whatever be the tinge which the tegument presents in different races of men, or in individuals during life. The different hues it assumes vary from a rosy pink to a pale white, evidently depending upon the vascularity of the part. It is evident therefore that the cause producing a variety of colour, must be sought in one of the parts external to the true skin. The *cuticle* is the outer layer of the three. Though thin in most parts, it becomes thick and indurated in the soles of the feet, or wherever it is habitually subjected to pressure. Its inner surface is connected with the rete-mucosum and corium by minute and very delicate

bands, and also by the perspirable ducts. It appears to be quite insensible, destitute of vessels or nerves, and has been likened by some anatomists to the scales of fishes. A better comparison would have been to a thin and semitransparent coat of isinglass, which protects the sensible surface of the skin from irritation, lessening evaporation, and to a certain extent resisting the absorption of injurious substances. The *rete-mucosum*, described by Malpighi, as a net-work, is situated between the cuticle and cutis, and is more and more easy of demonstration as the skin becomes of a black or dark brown colour. I had some years ago, when a pupil of Sir B. C. Brodie, at St. George's Hospital, an opportunity of examining this membrane in a Negro, admitted under the care of Dr. Seymour, to whose chest several blisters were applied. If the blister remained about twelve hours the cuticle only was detached, and the exposed surface appeared covered with a dark coating; but if the blister remained longer, and was of a more active nature, another layer of a dark colour was separated with the cuticle and came away with it. This is the *rete-mucosum*, which gives to the different races of mankind various hues, for the other layers of tegument are colourless, as can be proved by maceration after death. Of the nature of the substance on which the colour of the human body depends, much difference of opinion has long existed. Nerves have never been traced into it, nor has any process of injection shown in a healthy state that blood-vessels enter it; and the conclusion drawn by many authorities is, that the *rete-mucosum* is a deposit or secretion, rather than an organized membrane. This

is the conclusion most in harmony with the facts before us, although Gautier and Dutrochet have pretended to demonstrate four layers arranged in scales, one over the other. Their eyes and microscopes must either have been of a very powerful construction, or their powers of observation different from other anatomists. In white men this peculiar secretion is colourless, and becomes so thin and transparent, as to render it difficult of demonstration. Bichât and Dr. Gordon from these circumstances were inclined to doubt its existence in the white races altogether, but we generally find a viscid semitransparent fluid, analogous to the rete. As this structure, whether it is a spider-web like membrane, or a deposition of colouring matter, is the cause, and the only cause, speaking as an anatomist, of the various hues found among men; and as in the same individual one part of the body is sometimes white, and another black it must be evident, there is nothing in the colour of the skin, or in the causes producing it, sufficiently distinct to justify the assertion, that the black man was the offspring of other parents, at the first creation of man, or subsequent to that creation, than the white; and the attempt to assign to him a lower station in the scale of nature than ourselves because of his sable hue, is as false as it is detestable.

“For a’ that and a’ that,
He’s still a’ man for a’ that.”

Man is the only animal that can live in all climates; at the same time there is no doubt of the influence exerted by changes of temperature upon his body.

It is very singular that the traditions of almost every country tend to confirm the belief that man is of one species, and that his parents were at first placed upon one portion of the earth only. These traditions agree in a very remarkable manner in fixing the birth-place of our original parents. *Moses* fixes it in the south of Asia; the *Hindoo* traditions state that their progenitors came from the north west; the *Scandinavian*, that theirs travelled from the south west; and the *Chinese* assert that their forefathers came from the west; all pointing to the spot fixed in the book of God. When races have been continued through a long series of generations, they acquire the fixed characteristics of distinct species, and this fact uninvestigated has placed the unity of the species in much doubt and obscurity. The causes spoken of as likely to produce varieties in the human race are climate, food, and habits of life. It is reasonable to suppose, that if the tall and well-formed symmetrical Georgian was conveyed to the Arctic Circle, and exposed to the same food and modes of life as the inhabitants of such ungenial climes, his children would step by step dwindle into a race, small and stunted as the Esquimaux; in the same way that the acorn is seen to grow into a fine luxuriant tree, if planted in good ground, and to dwindle into an unsightly, misshapen, and knotted stump, if carried by the wind to the snow line of some mountain peak.

There can be no doubt that when at some distant period varieties arose in the human family, they, as our species increased, became the types of certain nations or tribes. It is also a singular fact that when any congenital deformity arises in a family it is continued

for generations. I have operated this day for hare-lip in a child, the offspring of the member of a family, in which this deformity has existed for longer than can be remembered. If then a variety arose in a family—if, living in tents, they wandered far away from the rest of mankind, no wonder their children and grand children inherited the peculiarity, whatever it might be, and in the *same climate* continued the variety.

Upon what other local circumstances the varieties in man arose, in addition to those already mentioned, cannot be very easily determined. The colour of the skin does not altogether depend upon temperature, for many facts might be adduced to prove that white men who have migrated into intertropical climates from the temperate regions of the earth, have not acquired the black hue of the native tribes. A race of Jews which is known on the coast of Malabar by the name of "*white Jews*," and who from documents in their possession appear to have migrated to India soon after the destruction of the temple by Titus in the year 490, still resemble European Jews in features and complexion. That food influences the action of medicines and produces certain alterations in the animal frame, admits of easy demonstration. The slender and delicate Hindoo, who lives entirely upon vegetable food; the Esquimaux, who gorges himself with the flesh of the seal, or the blubber of the whale, until he is unable to crawl about; the Otomac of South America, who during the period of the inundations is said to appease his hunger with unctuous clay and the English husbandman, who regales himself with beef and home-brewed ale; will all be differently affected with the same medicines, proving

that a difference in food produces idiosyncrasies in the constitutions of individuals, and a peculiar temperament or disposition, not common to men in general. When whole nations become deformed or stunted, the circumstance is not to be attributed to their being of a different species, but to the operation of climate, and the exposure to cold and hardships, as well as many other causes. Of the Bushmen (Bosjesmans), who are described as the most deformed of mankind, Lichstentein saw two individuals not more than four feet high: these unhappy people, who were plundered of their property by the early Cape settlers and hunted like wild beasts, are exposed to the greatest privations, and offer a convincing proof of the truth of the above assertion, that whole races may become deformed and stunted by exposure to constant cold, want of food, and other external causes. No picture of human degradation can be drawn in more appalling colours than that of the poor Bushman, wandering half naked through the land of his birth, and yet accurate observers, who cannot be suspected of undue prepossessions towards opposite sentiments and representations of human nature, have drawn a less unfavourable sketch of their moral and intellectual character. Mr. Burchell, who had many opportunities of conversing with them, discovered numerous traits of kind and social feeling and the essential attributes of humanity, peeping from under the dark ignorance by which they are surrounded.

IX. WILD MEN.

In the table of attributes peculiar to man language has been insisted upon, and in another part of this

work also, as a mark of distinction between man and the brute; the ruder faculties and feelings of animals do not require such assistance. The natural language of inarticulate sounds is sufficient for their purpose. The wonderful discovery of alphabetical writing and the invention of printing perfect the benefits derived by man from the power of speech. This noble prerogative (speech) is shared by all the races of men, and man possesses also an innate feeling, which, without cultivation, to a certain extent prompts him to do that which is good, and warns him of evil. Evidence is afforded of the power of speech being universal, from the fact that there are no dumb nations. All men, even the most savage, convey their ideas by words, and all are capable of distinguishing good from evil. No man could be placed upon a desert from infancy with another of his species without some of the above traits of social feeling being displayed, without in some degree being able to distinguish right from wrong, and, in succeeding generations, as his species multiplied, the marks of a higher state of civilization would become manifest. The instances given of wild men of the woods, lost children growing up as beasts, the Orsons of nursery-books, are not numerous, and the accounts written must be received with very great caution. Peter, the wild boy described by Swift in his "London strewed with varieties, or it never rains but it pours," and by J. J. Rousseau as the child of nature, appears to have been nothing more or less than a poor idiot. In a work published in Paris in 1671, entitled "Histoire d'une Fille Sauvage," Condamine describes a young wild girl. A wild man found in the Pyrenees is men-

tioned by Leroy, and also a boy found near Aveyron and brought to Paris, soon after the revolution: still these accounts are allowed by all who have examined them to be little entitled to belief. Other narratives speak of wild men going upon all-fours, and exhibit the extent to which men have taxed their powers to invent that which is not true; for it is quite certain, that did man possess no other power than the instinct of the lower animals, it would be sufficient to point out to him the erect attitude, as best suited for comfort and progression. Peter, the wild boy, is admitted to have walked erect, and this poor creature, in common with the other examples quoted, are only examples of instances in which the ordinary rules of nature have been violated; and to erect such cases of malformation as types of the natural condition of mankind, is manifestly as contrary to reason as opposed to facts acknowledged and received.

X. REASON OF MAN COMPARED WITH THE INSTINCT OF ANIMALS.

In the comparison about to be instituted between man and other animals, man will be found to possess some things in common with brutes; and although the latter have some advantages peculiar to themselves, they, on the other hand, are clearly destitute of those which are enjoyed in an eminent degree by our species. The grand resemblance between men and brutes is that they are both material. Like them we have living organized bodies which are produced by generation and birth, and supported by food. Both have strength and

animal spirits, enabling them to fulfil the different functions assigned to them; both have voluntary motions; the free exercise of their limbs, senses, sensations, imagination, and memory. Through the instrumentality of the senses both experience the enjoyment of pleasure, or the pang of pain, which causes them to desire certain things and to reject others; both have a natural propensity for self-preservation, and both are subject to those general corporeal accidents which the catenation and different relation of things, the laws of motion, the structure and organization of their bodies must occasion. Brutes have several advantages over men, in the pleasure resulting from sensual gratifications. A very principal one is, that they do not require the clothing, instruments of defence, and conveniences which men do, and which they are obliged to invent themselves, or to learn and to exercise the arts that are necessary to procure them. Animals bring into the world all that they require, or if any thing be still wanting to obtain it, they have only to follow the instinct received from nature, which, never deceiving, conducts them in safety, and as soon as their appetites are satisfied, they are perfectly content and desire nothing further, enjoying the present without being concerned for the future.

In these respects brutes are superior to men. Man is obliged to meditate, invent, labour, exercise himself and receive instructions, without which he would remain in a state of helplessness, and would with difficulty procure the common necessaries of life. His passions, so far from guiding, tend to lead him astray. It is reason alone that constitutes the great and essential

difference between man and the brute, indicates to him the means of satisfying his wants, and gives him prerogatives to which the beast can never attain. Gifted with the faculty of reason, man is enabled to procure every necessary, and every luxury, to multiply all his pleasures, and to ennoble and render them subservient to the best purposes. His mind experiences delights which are unknown to the "cattle of the field," pleasures whose sources spring from knowledge, wisdom, religion, order, and virtue, and which infinitely surpass all merely sensual gratifications, inasmuch as they tend to improve and promote the perfection of human nature; causing it more and more to resemble the divine essence of God, and they endure for ever; whilst, on the contrary, the more a man indulges in sensual gratifications, the more does he become unfitted for any thing great and dignified, and approaches nearer to the system of the brute.

It may also be added, that the sphere in which animals are permitted to move is very narrow and confined, their desires and propensities are few, and their pleasures little diversified, while those of man are infinitely varied; he is interested more or less in all subjects, and there is nothing which he cannot convert to his utility. He is the only being upon earth that is advancing progressively towards perfection, continually making new discoveries and enlarging his stores of knowledge; all other animals remaining constantly confined within a limited circle, neither capable of invention, nor able to attain to greater perfection, always continuing at the same point, unable by application and exertion to soar above other animals of the same species.

Reason then has ever been regarded as the great point of distinction between man and the brute. Some attempts have been made to confound this reason with the instinct of animals, and to prove that instinct is a kind of reason. Although all philosophers admit that the enjoyment of reason is the chief and most important attribute of the human mind, it is curious to observe the various definitions given by writers to the same expression. One, considers it as a peculiar faculty of the mind belonging exclusively to man; another, describes it as an enlarged and complete manifestation of the faculty observed in a greater or less degree in all animals; and a third, as either a combination of the higher faculties of the mind, or the peculiar direction of them. In an examination of this subject a difficulty arises at the commencement; for how is the mental nature of man to be compared with the instinct of animals, unless as complete a knowledge of their internal sensations is possessed as of our own. This evidence is wanting, and therefore it is only by comparison that a correct opinion can be formed. If the effects are considered which result from the natural operations of both, a correct idea may be formed of the wide distinction existing between reason and instinct. A man, however stupid, is enabled to govern and subdue the most sagacious of animals; this he effects, not by the exercise of bodily strength, for in this in many instances he is greatly inferior; but by the superiority of his intellectual power acting in a systematic manner, he compels the beast to obey him and to minister to his pleasures, wants, and necessities. The most powerful and sagacious of animals are incapable of com-

manding the inferior tribes or reducing them to a state of servitude. The stronger, it is true, devour the weaker, but this admitted fact proves only that urgent necessity compels them to partake of food in order to sustain life; and the flesh-eating animal, the tiger, or bird of prey, attacks other animals prompted by the same innate love of life which is implanted for their preservation, and which is shared equally by the cow which crops the grass beneath her feet. If animals possess even in a limited degree the power of reason, why do not some of them give proof of it? Why does not the elephant assemble others, and electing a king form a sort of army to subdue the inferior animals, and make them furnish their food and supply their wants? But none of this superiority is observed, and therefore the conclusion may reasonably be drawn, that the nature of man is not only far superior, but likewise of a very different kind from that of the brute.

When man was first created, no raiment sheltered him from the meridian sun-beam; no weapons were furnished as a defence from the beasts of the field; no tent protected him from the dews of night; feeble, without food or clothing, he appeared created but for inevitable misery. Surrounded by evils on every side, the remedies remained hidden. But from the God who made him man had received the gift of reason, the gift of inventive genius, which furnished a covert from the storm and a protection from the burning sun. This prerogative of invention was looked upon as so important in the more early periods of society, that it has been honoured by divine worship as the *Thoth* of the Egyptians, and the *Hermes* of the Greeks.

I propose to comment at some length upon this part the subject, and its importance is a sufficient excuse. It must at the same time be admitted that much that is connected with it is far beyond the ken of mortal eye, and therefore it will be better to confine such remarks to that which admits of demonstration, rather than consume much of life "in laboriously doing nothing." We may have dived into the recesses of philosophy sufficiently to admit the truth of the above remark of that illustrious scholar Grotius;—we may have been instructed by the wisest and the best how little can be discovered after the most laborious research, yet the rapid strides that have been made in the various sciences, viewed as evidences of the unassisted power of man over the brute, and his relation to some higher sphere of existence, whilst they tend to exalt human genius, force us to lament its misapplication. In every department of human knowledge there is a point where the inquiring eye must remain fixed; there is a line on which is marked, "this is the boundary beyond which the mental telescope can trace no other object." It will, however, be well to remember that this knowledge must be conveyed to the mind like food to the body; it must be digested, assimilated, and exposed to the action of reflection and meditation before the truths collected by others can be made our own. The man, therefore, who has little to be proud of beyond a capacious memory, though his mind may be stored with the records of past ages, is often extremely deficient in faculty of reason and common discretion, when placed in the embarrassing concerns of life; while he who may want this prompt recollection of the past, but is

notwithstanding possessed of a sound and discriminating judgment, has within his own bosom an adviser that can frequently extricate him from difficulties which would overpower another man. Hence Cowper has said "that knowledge and wisdom, far being one, have oftimes no connexion." "We find knowledge treasured up in the hands of men"—"replete with thoughts of others."

Knowledge, a rude unprofitable mass,
The mere material with which wisdom builds.
Knowledge is proud that he has learned so much ;
Wisdom is humble that he knows no more.

TASK, BOOK VI.

Having made the above remarks, it may be necessary to inquire what is the difference between reason and instinct? are the actions of some animals worthy the appellation of reasoning? and how far the instinct in some of the lower animals bears an analogy to the more exalted principle in man?

In contemplating the operations of animals from man down to the seemingly most contemptible insect, we are necessarily compelled to refer them to pure instinct, or original qualities of mind; variegated by nature according as the necessities, preservation, or continuation of the different species require. Let any man proceed a step further, and however he may deceive himself and flatter his own vanity, he must find at last that he is clouded in obscurity, and that men who have a more correct and unprejudiced way of thinking, will brand him with absurdity, and with acting

in direct opposition to the constitution of the human mind. "It cannot (says Smellie, in the second volume of the *Philosophy of Natural History*,) escape observation, that all the sagacity and laborious industry exerted in the various instances of animal architecture have one uniform tendency. They are all designed for the multiplication, protection, and nourishment of offspring. But many of them are so artful and require such persevering labour, that the human mind is bewildered when it attempts to account for them. Recourse has been had by Des Cartes, Buffon, and other philosophers, to conformation of body and mechanical impulse. Their reasonings, however, though often ingenious, involve the subject in ten-fold obscurity. It can hardly be supposed that the animals actually foresee what is to happen, because at first they have not had even the aid of experience; and particularly in some of the insect tribes the parents are dead before the young are produced. Pure instincts of this kind must be referred to another source. In a chain of reasoning concerning the operations of nature, such is the constitution of our minds that we are under the necessity of resorting to an ultimate cause. What that cause is, it is the highest presumption in man to define." Although entire ignorance must be pleaded of the cause, some of the effects can be traced and even partially understood, and from such effects may be perceived the most perfect wisdom, the most elegant and useful contrivances, to accomplish the varied and wonderful designs of nature.

Doctor Thomas Hancock, in his "Essay on Instinct," has defined the difference between instinct and reason

with a simplicity and clearness that demand our warmest thanks. He remarks, "On surveying the actions of men and brutes, there seem to be sufficient logical grounds for making two grand distinctions; the one comprising those actions which appear to be done blindly, or without premeditation and without experience; and the other, those which are done with forethought, by *combining means to accomplish ends*, which are often the result of individual or social experience and instruction."

These general facts seem so obvious that they lead us at once to call them by different names, and to conclude that they arise from different propensities or faculties: and the words *instinct* and *reason* come up as nearly to the view of the case as any other that could be employed. Hence while REASON acts with intelligence and design (variably indeed and inconstantly) profiting by experience, comparing motives, balancing probabilities, looking forward to the future, and adapting itself to any change of circumstance; INSTINCT operates with uniformity in all individuals of the same species, and performs its office with undeviating certainty prior to all experience.

"Hence (continues the author above quoted) if there be any actions which are performed with every indication of design, forethought, and wisdom, which are not the result of instruction nor of individual experience, but of a power operating above the consciousness of the creature, and directing it with unerring certainty to some specific ends, by means far beyond its comprehension, whether in man or in the brute; these actions are INSTINCTIVE. And on the other hand, if there be

any actions which evidently result from observation and instruction, indicating an intelligent power of combining means and adapting them to ends of which the creature is conscious. These actions come within the province of reason." (Essay on Instinct, p. 15.)

If Doctor Hancock's view of the subject is correct, it will be found that man himself, and more particularly during infancy, is not without instincts, which are designed for the preservation of existence at moments when divine reason, either from the slowness of its growth or want of promptitude and general efficiency, would be unable to overlook, or direct the various duties of the animal frame for which the former are appointed.

The works of animals, says Doctor Reid, "present us with a wonderful variety of instincts; the nests of birds so similar in their situation and architecture in the same kind, so various in different kinds; the webs of spiders; the ball of the silk-worm; the nests of ants and other mining animals; the combs of bees, hornets, and wasps; the dams and houses of beavers." But while every manufacturing art among men was invented by some man, improved by others, and brought to perfection by time and experience, and known only to those who have been taught them, in the arts of animals no individual can claim the invention. Every animal of the species has equal skill from the first, and that, without teaching, experience, or habit; "*every one has its art by a kind of inspiration*, not that it is inspired with the principles or rules of the art, but with ability and inclination to work it to perfection without any knowledge of its principles, rules, or end." (Reid's Essays, vol. iii. chap. i.)

But I will go further than this author. In building its nest the youngest bird forms it for the first time of the material commonly used by its species. It cannot build by comparison, for there is no other nest to examine; it cannot know the ultimate form of the new abode in which the eggs are to be deposited and the young birds hatched; yet the nest is commenced in the same way, proceeds stick by stick, is of the same size, the same shape, the same materials, so that any one acquainted with the nests of birds can at a moment pronounce the species it belongs to, by its size, shape, and materials. This is not imitation, for, as Addison contends in the second volume of the Spectator, "though you hatch a crow under a hen and never let it see any of the works of its own kind, the nest it makes shall be the same to the laying of a stick, with all the other nests of the same species. It cannot be reason, for were animals endued with it to as great a degree as man, their buildings would be as different as ours, according to the different conveniences that they would propose to themselves."

If the work of any animal is examined, it is like the works of nature perfect of its kind, sufficiently so to bear the most critical examination of the mechanic or mathematician;

For reason raise o'er instinct as you can,
In this 'tis God directs, in that 'tis man.

POPE.

Dr. Reid remarks in addition to what has been already stated, speaking of the honey-comb, that "there are only

three possible figures for the cells which can make them all similar without any useless interstices. These are the equilateral triangle, the square and the regular hexagon. Mathematicians know that there is not a fourth way possible, in which a plane may be cut into little partitions, that shall be equal, similar and regular without useless spaces. Of the three figures the hexagon is most proper for conveniency and strength. Bees, as if they knew this, make their cells regular hexagons. It has also been demonstrated that by making the bottoms of the cells to consist of three planes meeting in a point, there is a saving of labour and material no way inconsiderable. The bees, as if acquainted with these principles of solid geometry, follow them most accurately. It is a curious mathematical problem at what precise point the three planes ought to meet which compose the bottom of the cell, in order to make the greatest possible saving, at the least expense of labour and material. This is one of the problems which belong to the higher order of mathematics. It has accordingly been resolved by the ingenious Maclaurin by a fluxionary calculation, by which he determined the precise angle required, and he found by the most exact mensuration the subject would admit, that it is the very angle at which the three planes in the bottom of the cell of a honey-comb do meet." It has therefore been proved clearly that the bee builds the comb as strong as possible with the smallest quantity of materials; it cannot be supposed that this insect possesses a mind superior to man; it cannot be supposed that this peculiar shape is adopted with reference to cause and effect; therefore, although bees act geo-

metrically, yet they understand neither the rules nor the principles of the arts they practise so skilfully. The geometry observed in the honey-comb is not that of the bee, but of the great geometrician who made the bee, and made all things in number, weight, and measure ; who made the stars of heaven, and wove the web of which the buzzing fire-fly's wing is composed.

When we see, says Dr. Hancock, "that animals by instinct arrive at once to perfection in their art, while man is left to the exercise of his reason, in other words, to his own skill and ingenuity, and very slowly attains to perfection, we must conclude that the former are guided by a more perfect wisdom than the latter, at least in these outward concerns of life."

The same view is taken also by Addison in the second volume of the Spectator, number 120. He clearly illustrates the difference between reason and instinct, and observes, "Animals in their generation are wiser than the sons of men, but their wisdom is confined to a few particulars, and lies in a very narrow compass. Take a brute out of his instinct, and you find him wholly deprived of understanding. To use an instance that comes often under observation.

"With what caution does the hen provide herself a nest in places unfrequented, and free from noise and disturbance? When she has laid her eggs in such a manner that she can cover them, what care does she take in turning them frequently, that all parts may partake of the vital warmth? When she leaves them to provide for her necessary sustenance, how punctually does she return before they have time to cool, and become incapable of producing an animal? In the

summer you see her giving herself greater freedom, and quitting her care for above two hours together; but in winter, when the rigour of the season would chill the principles of life, and destroy the young one, she grows more assiduous in her attendance, and stays away about half the time. When the birth approaches, with how much nicety and attention does she help the chick to break its prison? not to take notice of her covering it from the injuries of the weather, providing it with proper nourishment, and teaching it to help itself; nor to mention her forsaking the nest, if after the usual time of reckoning the young one does not make its appearance. A chymical operation could not be followed with greater art or diligence than is seen in the hatching of a chick; though there are many birds that show an infinitely greater sagacity in all the forementioned particulars."

Addison, in the above extract, gives to the hen the power of "reckoning" how many days she ought to sit. This I deny, thinking it quite as reasonable to conclude that the same instinct which directs her to remain upon the eggs, prompts also the discovery of some peculiar change in the egg which proves the germ of vitality to exist no longer. The fact of sheltering her young proves not even in an old bird the power of reason; proves not that she protects them, because on other occasions the wing was found a shelter to the young brood; not at all; the first chicks ever hatched were protected by this hen in exactly the same manner, and the young birds therefore run to the parent, guided by an instinct which is inherent, and which induces them to run there for protection. It is clear also that

the hen possesses no language, no words to call them to her breast; they follow the peculiar dictates of their nature, and thus the young offspring of the duck, though hatched under the hen, run at once into the water, and no tones of distress, no calling, no signs that can be made, will induce them to leave that element for which they are by nature intended, and which is absolutely necessary for their health and growth.

But at the same time, continues the writer in the *Spectator*, "this hen with all this seeming ingenuity which is indeed absolutely necessary for the preservation of the species, considered in other respects, is without the least glimmerings of common sense. She mistakes a piece of chalk for an egg and sits upon it in the same manner; she is insensible of any increase or diminution in the number of those she lays; she does not distinguish between her own and those of another species; and when the birth appears of never so different a bird will cherish it as her own. In all these circumstances, which do not carry an immediate regard to the subsistence of herself or species, she is a very idiot. There is not any thing in nature more mysterious than this instinct in animals, which rises above reason and falls infinitely short of it. Thus must it be regarded as the immediate direction of Providence, and such an operation of the Supreme Being as that which determines all the portions of matter in their proper centre."

Often when a boy have I wondered at birds being unable to discover a stone from an egg. When "birds-nesting," if a nest is found with only one egg it must not be left, or some one else will possess the

treasure ; if this is taken, and the bird "lays" no more, the string will be curtailed of the usual proportions. The egg is taken, a stone supplies the place of it, and the bird will continue to deposit its eggs until the usual number is complete, and if the stones are left will sit upon them. This fact I know to be true, for it has been tested by repeated experiments.

A writer, quoted by Bayle in his essay "on the souls of brutes," delivers this remarkable opinion :—

"Deus est anima bruterum."

God is himself the soul of brutes, is the interpretation, and bold as is the opinion, it seems to possess the germ of truth. "For my own part," he concludes, "I look upon instinct as upon the principles of gravitation in bodies, which is not to be explained by any known qualities inherent in the bodies themselves, nor from any laws of mechanism, but according to the best notions of the greatest philosophers is an immediate impression from the first mover, and the divine energy acting in the creatures." (Essay on the Souls of Brutes.)

XI. DIVINE INTELLIGENCE OF THE HUMAN MIND.

It can easily be proved that the received opinion among all nations and tribes, from the earliest ages down to the present time, has been that a guide superior to discursive reason was implanted in the human mind—a principle which indeed might have "the assistance of reason, the highest natural gift to man,

but was antecedent to it and above it, and had rules for government distinct from reason, evidences of another kind and objects altogether different. For as reason, or the natural understanding, has objects like those subsisting between the outward senses and their natural objects, so has this principle objects, tastes, and feelings, peculiarly its own." (Hancock, page 206.)

Every one must admit that when men of cultivated minds, in different ages and nations, are agreed in opinion upon any philosophical question, we have the strongest reason next to revelation for concluding that it is founded upon the truth.

Epictetus says, "that God has assigned to each man a director, his own good genius; a guardian whose vigilance no slumbers interrupt, and whom no false reasonings can deceive, so that when you have shut your door and darkened your room, say not that you are alone, for God is within, and your guardian is with you."

Aristotle writes, "the mind of man hath a near affinity to God, and that there is a divine ruler in him.

Nes theis συγγενεστατος, τὸ θεῖον ἐν αὐτῷ αρχον."

He also declares, there is "something in the mind better than reason and knowledge, which is the principal and original of it, for the principle of reason is not reason, but something better. Intellectual knowledge is acquired by diligence, but wisdom comes from God."

Plutarch says, "the light of truth is a law not written in tables or books, but dwelling in the mind, always as a written rule which never permits the soul to be destitute of an interior guide."

“The light and spirit of God are as wings to the soul, or as that which raiseth up the soul into a sensible communion with God above the world.” (Plato.)

Antoninus calls the mind or rational principle of man, “a portion or particle of the Divinity.”

Epictetus designates it, *Τὸν Διὸς μέρος*, a part of the Deity.

Horace remarks, “*Divinæ particulam auræ*,” a particle of divine life or essence. Seneca calls it, “*Scintilla divinæ lucis*,” a spark of divine life. Cicero, “*Radiatio Dei* ;” and in another place (*Ciceronis Tusc. Quæst.*) he adds, “*Humanus animus, decerptus ex mente divina, cum alio nullo, nisi cum ipso deo, si hoc fas est dictu comparari dictu.*” If it be right thus to speak the human mind (soul), being extracted from the divine intelligence, can be compared with no other being save God himself.

Can this part of the subject be better left than with the recorded opinions of men who have been famed for their talents and learning, since against such a host of witnesses the opinions of a few can have little weight in invalidating the conclusion. It was, says Dr. Hancock, “the error of Stahl and some other reasoners of his school, that the rational soul, as it was called, was said to superintend every operation in the body as well as the mind. But the simplest view of the animal economy will convince us that those things which are done without animal consciousness, cannot be referred to the same identical motive power which acts in cases of free animal volition. Our volition is no more immediately concerned in our own secretion, assimilation, nutrition, absorption, &c., than if these functions belonged to

another being. Therefore our own rational soul (admitting the expression) can have nothing to do with these functions, for they belong to the brute equally with ourselves. But our mind can determine and act according to certain laws, and display certain phenomena purely its own, arising from its own capacities and powers; in like manner can the brute; therefore two principles are at work simultaneously in each. The one divine and omniscient, superintending vital actions in their very elementary motions, entrusted neither to man nor to brute, because requiring nothing short of divine power to execute them; the other limited in each according to the measure granted by the Deity for certain specific ends, entrusted to the creature's own senses, appetites and mental endowments, varying in every creature according to its organization, though derived originally from the same almighty power.

It is clear, therefore, that there is a two-fold agency of mind in these cases—a pure, unlimited, intelligent, regulating impulse, independent of the creature, and a limited, uncertain, irregular, inefficient, power of volition, according to the degree of mental energy, varied infinitely in different creatures." (Essay on Instinct, page 155.)

"The mind of man, while it is still united with the body, still subject to the dominion of sense and appetite, and imprisoned, as it were, in an earthly tenement; which can loosen itself from this connexion, subdue its low desires, overcome its natural tendencies, and already anticipate by its virtues a better state; whatever the materialist may think certainly proves its superiority to the elements that surround it; clearly proves that it

has no essential and indissoluble affinity with these elements, and discloses its real tendency towards a state of existence in which the opening bud of its virtues can only blossom into perfect life." (Page 151.)

If man is found to be the only creature under the canopy of heaven (as we cannot doubt he is) who knows he has the power to obey or break the laws of God, and to obtain his favour by obedience; this boon, this exalted privilege, must have been bestowed for some lofty purpose, and it impresses upon him the type of peculiar estimation. A power to resist (in a limited degree, it is true) the designs of the Omnipotent, and to rise by his own free choice, (for he is a *free agent*,) and virtuous conformity to the will of heaven, into a nearer bond of union with his Maker. He cannot be made to conceive that the inferior tribes of animals, any of which he "may freely kill" for his food, can have any interest in an immortal soul, or share with him the joys and happiness of heaven, *to which his own hopes are instinctively directed*; or that they bear any resemblance to the superior beings and kindred spirits with whom his budding capacities are alone capable of enlargement; nor is he able to trace any thing existing in them analogous to those sympathies, affections, and desires, springing up in his own mind altogether independent and disjointed from the ordinary concerns of this life.

I cannot close this chapter without cautioning the young medical student against that plague-cloud, materialism, that so long has cast its baneful shadows over our land. Perhaps the mere anatomist can see no traces of a principle distinct from matter in the dis-

secting-room, in a body where the effacing finger of decay hath stolen the last trace from beauty's cheek, or the last muscle which clothes with the semblance of humanity the dry bones of the skeleton; perhaps one who has spent a life in comparing one muscle with another, and the functions of man with those observed in the inferior tribes of animals, will ever take a less comprehensive range of the human mind and its varied relations, than another, less tied and chained by dogmas and opinions received second-hand from others, and perhaps admitted without the slightest examination. The knife of the anatomist will never put us in possession of a single fact connected with the operations of the mind; this information is possessed without his assistance, and he is the last being a rational creature would think of commissioning to convey information concerning an immortal and immaterial principle. The Almighty has thought fit to allow an immaterial soul to be connected with matter, and it appears clear, that which is superior is sometimes imprisoned by that which is its inferior; the mind by matter, the heavenly with the earthly, the good by the evil tendencies; but why this should be the case is a question that it would be as presumptuous for the reader to ask as it would be for me to attempt to answer.

“ There wanted yet the master-work, the end
Of all yet done; a creature who, not prone
And brute as other creatures, but endued
With sanctity of reason, might erect
His stature—in devotion to adore
And worship God supreme, who made him chief
Of all his works.”

MILTON.

Whatever the wretched materialist may theoretically conclude, it is impossible to suppose he can seriously believe that a little variation in form, or a nicer texture in the brain, constitutes all the difference between himself and the higher orders of brutes. There is a wretched vanity in all this; as David Hume well remarks, "men come at last to believe that without divine assistance, by their own wisdom only they may be happy, and in such a degenerate state a philosopher may arise who will say, that the less religion a man has the happier he will be." But, concludes Doctor Hancock, "as the soul of man, when engrossed with pleasure, or eager for fame, or ambitious of power, or even ardent in the search after knowledge, refuses to be satisfied; and reason, though abundantly engaged in the pursuit, cannot satisfy it in any of these sublunary inquiries. It must have an affinity to something above sense, which is immortal." (Page 196.)

The eye need not wander in the present day very far to perceive in what mazes and labyrinths of confusion men seek to involve us, by a dependance upon human reason only, and not "the better guide;" with what facility they labour to make "the worse appear the better reason;" how men by the doctrines they advocate, sink themselves beneath the level of the brute. It is vain to attempt to deny the existence of that which cannot be demonstrated, for we are as ignorant of the essence of matter as of mind, nor can a smile be suppressed at the self-complacency of the would-be philosopher, who denies the existence of every thing that cannot be turned up by the point of his dissecting

scalpel.* Without wishing to enter the arena of controversy with members of my profession, whose many attainments I respect, it is impossible in a work of this nature not to notice such expressions as, "the point at issue actually comprised in the variation of a single diphthong is so minute as to be scarcely visible to the nicest theological eye"—† "where shall we find proof of the mind's independence?"‡ and so on.

Now, one of two positions must be maintained.

1. *That matter can become a thinking substance without adding any thing to it.*

2. *That matter cannot think at all.*

If matter can acquire the faculty of thinking without adding any thing to it, it must at least be admitted that all matter does not think, and even that some material now possessing the power of thought did not think fifty years ago. For example, the matter of which our bodies is formed did not think ten years before we were born. Matter must therefore acquire the faculty of thinking by a certain configuration, ranging and motion of its parts. Let us, for instance, suppose the matter of a stone or of a heap of sand. It is agreed that this part of matter has no manner of thought, and therefore to make it begin to think all its parts must be formed, ranged, and moved in a certain way, and to a certain

* Dr. Hancock's work on Instinct contrasted with Reason, ought to be carefully read, and the arguments of this profoundly philosophical writer attentively examined.

† Gibbon.

‡ Lawrence.

degree, above and below which matter cannot think. Who is it, then, that has given all those just, exact, and precise modifications to a vile and shapeless matter in order to form the body of a child, and to render it rational by degrees. If, on the contrary, matter cannot become a thinking substance without adding something to it, what will that reasoning atom be whilst the matter to which it is wedded only moves? Here then are two natures—two substances, as unlike and as distinct as possible. One is discovered by figures and by local motions only, the other by perceptions and reasonings;—the one does not imply or create the idea of the other, their respective ideas possessing nothing in common.

CHAPTER VI.

REVIEW OF THE OPINIONS OF OTHER
WRITERS AS TO THE UNITY OF THE
HUMAN RACE, &c.

WILLIAM LAWRENCE, ESQUIRE.

" THAT the Negro is more like a monkey than an
 " European cannot be denied as a general observation.
 " But why is the Negro always selected for this com-
 " parison? why is he made to fill up the break in
 " Mr. White's chain between the European and the
 " monkey? I do not hesitate to assert that the notion
 " of specific identity between the African and the
 " ourang-outang, (on which point Mr. White's language
 " is not sufficiently clear to enable me to decide what
 " he means,) is as false philosophically, as the moral
 " and political consequences to which it would lead are
 " shocking and detestable. The human species has
 " numerous distinctive marks by which, under every
 " circumstance of deficient or imperfect civilization,
 " and every variety of climate and race, it is separated
 " by a broad and clearly defined interval from all other
 " animals, even of those species which from their
 " general resemblance to us have been called anthropo-
 " morphous. Mankind in general, the unlearned and
 " the unscientific, do not commit the gross mistake of

“ confounding together man and animals; this distinction at least, so clear and obvious to common observation and unprejudiced common sense, is preserved in their short division of the animal kingdom into man and brutes.

“ Other writers, who expatiate with vast delight on what they call the regular gradation or chain of beings, and discover great wisdom of the Creator and great beauty of the creation in the circumstance, that nature makes no leaps, but has connected the various objects of the three kingdoms together like the steps of a staircase or the links of a chain, represent man only as a more perfect kind of monkey, and condemn the poor African to the degrading situation of a connecting link between the superior races of mankind and the ourang-outang. If by regular gradation nothing more is meant than the variety of organization and its progressive simplification from man throughout the animal kingdom, the truth is incontestible and too obvious to require a *quarto* for its illustration and support. On the contrary, if it be designed to assert identity of species between ourselves and monkeys, the position is quite untenable.”

Lectures on Man, seventh edition.

PROFESSOR BLUMENBACH.

“ The peculiar characteristics of man appear to me so very strong, that I not only deem him a distinct species, but also put him into a separate order by himself. His physical and moral attributes place him

“ at a much greater distance from all other orders of
 “ mammalia, than those are from each other respectively.
 “ Order bimanum (two-handed); genus homo; the species
 “ single, with several varieties hereafter enumerated.
 “ Characters; erect stature; two hands; teeth approxi-
 “ mated and of equal length; the inferior incisors per-
 “ pendicular. Prominent chin; rational, endowed with
 “ speech; unarmed; defenceless.”

De Generis Humani Varietate Nativa, 12mo.

The scientific world is much indebted to the labours of Blumenbach. He selected the physical history of man as the subject of his inaugural thesis (Goetting. 1775), and afterwards presented it to the world under the above title. The subject once introduced into the arena of investigation has since claimed the attention of men of learning in this and other countries, and when its immense importance is considered no labour appears too great, no time too long, for its investigation. Man has made tools for assisting his labour, and hence Franklin designates him the “tool-making animal;” but, says Mr. Hobbes, “the most noble and profitable invention of all others was that of speech, whereby men declare their thoughts one to another by mutual utility and conversation, without which there had been among men neither commonwealth or society, no more than amongst lions, bears, and wolves. This is a most important distinction, since it is not born with him like the voices of animals, but has been framed and brought into use by himself, as the arbitrary variety of different languages incontestably proves.”—*Leviathan*.

M. CUVIER.

“The first savages collected in the forests a few
“nourishing fruits, a few salutary roots, and thus sup-
“plied their more immediate wants. The first shep-
“herds observed that the stars move in a regular course,
“and made use of them to guide their journeys across
“the plains of the desert. Such was the origin of
“mathematical and physical sciences.

“Once convinced that he could combat nature by
“the means which she herself afforded, genius reposed
“no more; it watched her without relaxation; it in-
“cessantly made new conquests over her, all of them
“distinguished by some improvement in the situation
“our race.

“From that time a succession of conducting minds,
“faithful depositaries of the attainments already made,
“constantly employed in connecting them, in vivifying
“them by means of each other, have conducted us in
“less than forty ages, from the first essays of rude
“observers, to the profound calculations of Newton
“and La Place, to the learned researches of Linnæus
“and Jussieu. This precious inheritance perpetually
“increasing, brought from Chaldea into Egypt, from
“Egypt into Greece, concealed during ages of disaster
“and darkness; recovered in more fortunate times,
“unequally spread among the nations of Europe, has
“every where been followed by wealth and power; the
“nations which have reaped it are become the mistresses
“of the world, such as have neglected it are fallen into
“weakness and obscurity.”

*Cuvier's Reflections on the Progress of Sciences, read before
the Members of the Royal Institute of France, 1816.*

BUFFON.

“ Upon the whole, every circumstance concurs in
“ proving that mankind are not composed of species
“ essentially different from each other; that on the
“ contrary there was originally but one species, which
“ after multiplying and spreading over the whole surface
“ of the earth, has undergone various changes by the
“ influence of climate, food, mode of living, epidemic
“ diseases, and mixture of dissimilar individuals; that
“ at first these changes were not so conspicuous, and
“ produced only individual varieties, and these varieties
“ became afterwards more specific; because they were
“ rendered more general, more strongly marked and
“ more permanent, by the continual action of the
“ same causes; that they are transmitted from gene-
“ ration to generation as deformities, or diseases pass
“ from parent to children; and that lastly, as they
“ were originally produced by a train of external and
“ accidental causes, and have only been perpetuated
“ by time and the constant operation of these causes,
“ it is probable that they will gradually disappear, or,
“ at least, that they will differ from what they are at
“ present, if the causes which produced them should
“ cease, or if their operation should be varied by other
“ circumstances and combinations.”

Natural History by Wood, vol. iii. p. 446.

MAXIMUS TYRIUS.

Maximus Tyrius, the Platonic philosopher, affords very striking testimony with regard to the universal

consent of mankind in a very important truth. Speaking of the existence of the Deity he says, “ In such a contest and tumult and disagreement, (about other matters of opinion,) you may see this one law and language acknowledged by common accord. This the Greek says, and this the barbarian says, and the inhabitant of the continent and the islanders; and the wise and the unwise.”

*The original is quoted by Stewart—Elements,
vol. ii. p. 80.*

DR. HANCOCK.

“ Now it may be observed, that reason in the enlarged acception to which I have alluded, embraced three powers or principles very necessary to be distinguished.

“ I. It included that power of the mind which enables it to investigate and find out truth speculatively, as in science and the common business of life, by observation and experience, and to distinguish it from falsehood by means of propositions, comparisons, and deductions; hence properly called the discursive faculty or power of reasoning.

“ II. It comprehends the elements of reason itself—the rudiments, seeds, or principles, from which all natural reasoning must spring; denominated by Judge Hale, ‘ rational instincts’—by Bayle, ‘ the innate light of reason, or primitive ideas and rules of true or false’—by Cudworth, ‘ innate cognoscitive power’—by Stewart, ‘ the fundamental laws of human belief, or primary elements of human reason,’—by Reid and

“ Beattie, ‘the principles of common sense, as being
“ COMMON TO ALL MANKIND.’ ”

“ III. The power or source of moral sentiment from
“ which man receives primarily the emotions which
“ give rise to the knowledge of right and wrong, good
“ and evil; and by which he is enabled to feel the
“ obligation of duty to God and to his fellow-creatures;
“ in which power may be included the first principles
“ or seeds of moral truths; the sparks of a divine
“ intelligence in the soul, the light that enlighteneth
“ every man—from the necessity of the case, changing
“ the metaphor to express the meaning more fully;
“ also variously denominated ‘the law written in the
“ heart,’—‘connatural moral instincts,’—‘the first rudi-
“ ments of natural justice, charity, and benignity.’ ”

Page 226 et 227.

LORD SHAFTESBURY.

“ It is a first principle in morals, that we ought not
“ to do to another what we should think wrong to be
“ done to us in like circumstances. If a man is not
“ capable of perceiving this in his cool moments, when
“ he reflects seriously he is not a moral agent, nor is
“ he capable of being convinced of it by reasoning.”

Essay on the Powers of the Human Mind, vol. iii.

J. J. ROUSSEAU.

“ Seeing that men’s desire in general is to hold no
“ religion but the true, and that whatsoever good effects
“ grow out of their religion, who embrace instead of

“ the true a false, the roots thereof are certain sparks
“ of the light of truth, intermingled with the darkness
“ of error ; because no religion can wholly and only
“ consist of untruths. If conscience speaks to every
“ heart, why then are they so few who listen to it? Ah!
“ it is because it speaks to us the language of nature,
“ which every thing causes us to forget. Conscience
“ is timid ; it loves retirement and peace ; it is alarmed
“ by the noise of the world ; the prejudices from which
“ they represent it to take its origin are its most cruel
“ enemies ; it flies away or is silent before them ; their
“ noise drowns its gentle voice and hinders it from
“ being heard ; fanaticism dares to counterfeit it, and to
“ meditate crimes in its name. Let us adore the
“ eternal Being—with a breath of air we destroy these
“ phantoms of reason which have only a visionary
“ existence, and flee away like a shadow before immu-
“ table truth.

“ Cast then your eyes over all the nations of the
“ world, survey all their histories ; among so many ab-
“ surd and inhuman forms of worship, among such a
“ prodigious diversity of manners and of character,
“ you will find every where the same ideas of justice
“ and of probity, every where the same notions of good
“ and of evil. There is, therefore, in the bottom of
“ our souls an *innate* principle of justice and of virtue,
“ by which in spite of our peculiar maxims we judge
“ our own actions and those of others to be good or
“ evil. I know not for what reason men would attribute
“ to the progress of philosophy the beautiful morality
“ of our books ; this morality drawn from the gospel
“ belonged to Christianity before it did to philosophy.

“ The precepts of Plato are often very sublime ; but
“ how frequently does he err, and to what extent do
“ his errors not reach ? As to Cicero, can we believe
“ that without Plato, this rhetorician would have dis-
“ covered his duties ? The gospel alone, as to its
“ morality, is always perfect, always certain, always
“ true, and always consistent with itself.”

*Translated from Ecclesiastical Politic. Book V.
and Pensées Rousseau.*

Some apology may be necessary for quoting the opinions of men like Lord Shaftesbury and Rousseau. Let it not for a moment be supposed that, because passages confirming my own views of a particular subject have been quoted, that I favour their general writings. This remark must also be made in reference to the extract from the “ Lectures on Man ;” the unbecoming levity and needless insult offered to serious subjects by men who could write so well is much to be lamented, is deeply to be deplored. With regard to Rousseau, his writings are supposed by many to abound with nothing but infidelity, presented in the most alluring form. This is not the case ; at one time he wrote, as is seen from the extracts here given, as though his mind was imbued with the seeds of virtue and religion ; at another, displayed the depravity and weakness of the infidel and libertine ; one moment we behold him soaring with the pinion of an angel, conveying to every quarter of the globe the germ of truth—the advocate of virtue, the defender of morality—the next encased in the mantle of a demon, and wallowing in the mire of earth’s lowest blasphemy, he casts before our

disgusted eyes the concentrated essence of iniquity. Still the acknowledgments of such a man cannot but be highly valuable, for they must be regarded as either the unconstrained testimony of the human mind on the side of virtue, or the spontaneous homage which is given by all men, in their cool and serious moments, to the universal and unchangeable light of truth; and such admissions must be regarded as forced from them in spite of every effort at concealment.

This power of distinguishing good from evil appears to be universally planted in the human breast, shared alike by all though differing in degree;—by black man, and by white man; it is a first principle of our constitution, there is no speculative opinion, persuasion, or belief, which is capable directly or indirectly of destroying it. That which is originally of a pure nature, nothing but habit and custom (second nature) is able to uproot; and this affection being an original one, of earliest rise in the soul, cannot be effaced at once even by the action of force and violence, or by means of the most extravagant belief in the world. Why then should not this power of distinguishing right from wrong be acknowledged to result from a bias impressed upon the mind by its Creator, as well as our love of society, or desire of self-preservation? Now if these judgments are not instinctive, how comes it that they are universally shared by the inhabitants of every quarter of the globe?

DR. REID.

“The faculties which we have in common with the
“brute appear first, and have the quickest growth. In

“ the first period of life, children are not capable of
“ distinguishing right from wrong in conduct ; neither
“ are they capable of reasoning in matters of science.
“ Their judgment of moral conduct, as well as their
“ judgment of truth, advances by insensible degrees,
“ like the corn or grass. The seeds of moral discern-
“ ment are at first tender and delicate, and easily
“ warped.

“ Our intellectual discernment is not so strong and
“ vigorous by nature as to secure us from errors in
“ speculation. It would be absurd from the errors and
“ ignorance of mankind, to conclude that man has not
“ a natural faculty of discerning truth and distinguishing
“ it from error. He must be very ignorant of human
“ nature, who does not perceive that the seed of virtue
“ in the mind of man, like that of a tender plant in an
“ unkindly soil, requires care and culture in the first
“ period of life, as well as our own exertion when we
“ come to maturity. The path of duty is a plain path,
“ which the upright heart can rarely mistake. Such it
“ must be, since every man is bound to walk in it.
“ There are some intricate cases in morals which admit
“ of disputation, but these seldom occur in practice ;
“ and when they do, the learned disputant has no great
“ advantage : for the unlearned man, who uses the best
“ means in his power to know his duty, and acts accord-
“ ing to his knowledge, is inculpable in the sight of
“ God and man. He may err, but he is not guilty of
“ immorality.”

Reid's Essays.

The above passages have been quoted to strengthen the position, *that there is implanted in the breast of*

the savage, in common with ourselves, a power of distinguishing between good and evil. However darkened and obscured this may be in part, it does not of necessity overshadow every bright ray of the divine spark of heaven. If this was the case, who could plead not guilty, who could escape condemnation, for who can deny that the wisest and the best have their minds bound down by the chains of errors, prejudices, and imperfect views? But notwithstanding all these things, now and then there does break forth some instinctive irradiations, amid the moral gloom of the most barbarous climes, and sparks of superior light at times, kindling as it were in the breast of the savage, prove him to be allied to ourselves.

Can, therefore, a right to share with us in the hopes of immortality be denied to the darkest heathen nations, because they adore, and bend their knees in prayer to the universal Father, in the sun, or cloud; or prostrate themselves before idols of stone, birds, or beasts, because they were never taught to tune their harps in praise of his great name? But who are the claimants of this mental superiority, seizing exclusively the title of men, in order to class the poor Negro with the monkey tribes? Children of the philosophers, who in *enlightened England*, scarce three hundred years ago, with the divine word of heaven as a guide, burnt at the stake unhappy women, for the supposed crime of *witchcraft*! Yes, these are the men, who argue that the Carib cannot distinguish right from wrong, because he eats the body of the foe just slain; or the Esquimaux, because he leaves his aged relative to perish; the Thug, because he sacrifices all who are not of his

creed on the altar of Kalee ; the Hindoo, because he dies beneath the wheels of Juggernaut; the Hindoo widow, because with supposed religious devotion, she expires a voluntary victim on the funeral pile of her deceased husband.

This power of distinguishing good from evil must be acknowledged as universal ; and in whatever way, proportion, or degree, communicated to man, has been derived from the same stream of purity and wisdom ; imparted to the civilized man, and his savage brother, with the breath of life, and the possession of reason. The channels may have been different, but the fountain has been the same. Whether instinctively revealed by conscience, that feeling which forbids the Greenlander to steal the canoe and fishing-spear of his neighbour ; or by that law which was written on tables of stone, and revealed in the pages of the Gospel.

DOCTOR PRICHARD.

“ On a review of all the facts connected with the
“ propagation of mixed breeds, we may conclude that
“ real hybrids are either barren or so little prolific, that
“ their stock is destined soon to become extinct ; while
“ the mixed offsprings originating from different
“ races within the limits of the same species, generally
“ exceed in vigour and in the tendency to multiplication
“ the parent races from which they are produced. I
“ do not wish to erect an important conclusion upon
“ this one argument, but its evidence, as far as that
“ and considerable weight must be allowed to it, is
“ manifestly favourable to the doctrine, that the several

“tribes of men are but varieties of the same species.”
—Page 150.

“ I have endeavoured to establish the general fact
“ that no remarkable instance of variety is discoverable
“ in mankind, of which a parallel may not be found
“ among the lower orders of the creation. Perhaps the
“ evidence may be nearly as complete as the nature of
“ the investigation could entitle us to expect it to be ;
“ still it is of a negative kind and not so cogent of
“ conviction as a positive argument would be. But
“ here I must refer my readers to the conclusions ob-
“ tained in the first and second chapters of the same
“ book, viz. those which contained physiological and
“ and psychological comparisons. These conclusions
“ carried with them something of positive evidence.
“ In the *first* chapter it was attempted to be proved,
“ that tribes of animals which belong to different
“ species, differ from each other physically in a variety
“ of particulars, in which the most dissimilar of human
“ races display no such differences. In the *first* place,
“ separate but even proximate species differ from each
“ other in the principal laws of the animal economy, as
“ those which govern the duration of life, and the facts
“ which relate to reproduction. Human races coincide
“ strictly in all these particulars. *Secondly*, different
“ species of animals have different diseases, are sub-
“ jected to different pathological laws, if I may use
“ such an expression. All human races are liable to
“ the same diseases ; at least the varieties which exist
“ in these respects are such as are produced by the
“ influence of climate. *Thirdly*, distinct species do
“ not freely intermix their breed, and hybrid plants and

“ animals do not propagate their kind beyond at most a
“ very few generations, and no real hybrid races are
“ perpetuated ; but mixed breeds descended from the
“ most distinct races of men are remarkably prolific.

“ The inference is obvious. If the mixed propa-
“ gation of men does not obey the same laws which
“ universally govern the breeding of hybrids, the mixed
“ breeds of men are not really hybrid, and the original
“ tribes from which they descend must be considered
“ as varieties of the same species.

“ In the second chapter, which contains psychological
“ comparisons, I endeavoured, in the *first* place, to
“ establish on a broad scale, that species even the most
“ nearly resembling, and belonging to the same genera,
“ are endowed with peculiar psychical qualities which
“ are even more distinct, and therefore more charac-
“ teristic of particular species, than peculiarities of
“ bodily structure ; that all species in fact differ from
“ each other in respect to their instincts, or those active
“ principles, which with wonderful constancy govern
“ the lives and habits of creatures belonging to each
“ kind, and give to each tribe an uniform and unvarying
“ character. *Secondly*, that mankind, however they
“ vary in different ages and countries in respect to
“ acquired habits and the arts of life, are yet subjected
“ not less than the inferior tribes to the influence of
“ certain impulses or active tendencies, which like the
“ instincts of animals are constant and invariable.
“ *Thirdly*, I attempted to prove by a survey of some
“ phenomena illustrative of the psychical character of
“ some of the most dissimilar of mankind, that they all
“ have common affections, sympathies, and are sub-

“jected to precisely analogous laws of feeling and
“action, and partake in short of a common psychical
“nature, and are therefore proved to belong to one
“species or lineage. Probable evidence from its nature
“admits of accumulation ; and perhaps it will be al-
“lowed that a considerable mass of evidence has thus
“been collected in support of one and the same con-
“clusion with respect to the tribes of mankind.

Researches into the Physical History of Mankind.

All writers who have investigated the subject, appear to come to the conclusion that the various tribes of men of whatever form, colour, or climate, are of the same species. True it is, that some have attempted to draw from the facts they may have collected an inference different from the learned authors already quoted ; but it has been done either in direct opposition to the evidence adduced, or in ignorance of the anatomical data from which a correct opinion can only be formed.

It cannot be denied, that even in modern times great ignorance has prevailed on this subject, evidenced by the writings of Monboddo and Rousseau. The former describes our species as “*monkeys without tails,*” and the latter has applied the observations of travellers concerning beasts to man. The only thing necessary to form the same opinion is to believe, that he knew better what they saw than they did themselves. The unsupported arguments of Rousseau and Monboddo prove that they were profoundly ignorant of the form and structure of man and monkeys, and therefore any position they may have taken is little likely to be true,

inasmuch as they were destitute of correct information upon the subjects pretended to be explained in their works. The men, however, most profound for their learning and most distinguished for philosophical research, agree in describing all men of the same species. The extracts quoted, as well as a careful examination of the writings of Buffon, Blumenbach, Zimmermann, Meiners, Soemmering, Ludwig, Hunter, Kaimes, Smith, Dr. Prichard, Mr. Lawrence, and Dr. Morton, cannot fail to lead the mind to the same conclusion, unless usurped by bigotry and blinded by preconceived opinions.

XIII. OF THE PSYCHICAL CHARACTERS OF THE MORE UNCIVILIZED RACES OF MANKIND.

There will be no difficulty in proving that all the races of men, however they may differ in form, colour, civilization, intellectual endowments, and moral attributes, have some feelings in common the one with the other, some sympathies shared alike by the philosopher and the savage. These intellectual endowments and moral attributes differ doubtless in degree, evidenced in the depravity of human nature; in the uneducated rustic, the uncultivated African, the idiot, and the insane. Any of the above examples prove man's moral imbecility when he is placed in circumstances unfavourable to his improvement, or physically incapacitated for obtaining it.

An acorn when thrown among thorns will not grow, yet it does not cease to be a seed; and it must by

the same train of reasoning be admitted that as all men have implanted in their hearts the love of justice, piety, equity, gratitude, and chastity, although all breasts may not prove congenial soils, nevertheless these must be regarded as traits of human nature, although they may not be so matured in the savage as in the inhabitant of some civilized city of the earth.

A slight examination of the subject will enable us to conclude, that there are implanted in the mind of every man by the Creator certain innate principles, capable of being enlarged by education, improved by example, and refined by experience. For example, good will in man towards man is universal; and, says Bishop Butler, "it is sufficient that the seeds of it be implanted in nature by God: there is much it is owned left for us to do upon our own heart and temper, to cultivate, to improve, to call it forth, and to exercise it in a steady uniform manner. This is our work; this is virtue, this is religion." Lord Bacon contends also that there are certain fountains in nature whence all civil laws are derived, but as streams, "and like as waters do take tinctures and tastes from the soils through which they run, so do civil laws vary according to the regions and governments where they are planted, though they proceed from the same fountains."

This remark of Lord Bacon, found accidentally since the above was written, serves to strengthen the conclusion drawn. It cannot be denied that there are sown in every breast the seeds of benevolence undefiled by selfish motives. These affections are displayed in various ways towards others, as in parental and filial affection, in sympathy or compassion for the afflicted, in veneration for the wise.

The faculties of man unfold themselves in a certain order appointed by the founder of the universal law governing mankind. In their gradual progress they may be assisted or kept back, ripened or corrupted, by education, instruction, example, or exercise, which like soil and culture in the flower may produce changes for the better or the worse. For in man there appears to be two active principles, either of which he is at liberty to select as his guide through life. As soon as thought has convinced man of this twofold nature, he should select and fortify the better part. But if instead of exerting his intellectual, he gives himself up to his corporeal faculties, the external senses become all in all, and the germ of good not only fails to blossom and produce fruit, but perishes by slow degrees. On the other hand, by cultivating this better part, with the things which belong to it, the soul throws off its alloy and becomes more and more pure. Thus when the separation under the form which we term death takes place, the soul disengages itself from its shroud like a fly from its chrysalis, and a more perfect state of being at once commences. This is the only true way in which the differences existing among the various races of men may be accounted for; the reason some men are little removed from the cattle in the field and the wild beasts of the forest, while others possess a god-like reason elevating them above their fellow-men, enabling them to examine more faithfully, and to admire more fully, the beauties of nature, and to feel the force and grandeur of the remark of Plato—

“The world is God’s epistle to mankind.”

Let us next examine the numerous facts that have been collected, with a view of proving the correctness of the above conclusions. Mr. Burchell, in his very interesting account of the Bushmen, informs us, that although the females are nearly naked, they display as much modesty as Europeans. "The girls are as delicate in feelings of modesty as though they had been educated in the most decorous manner." They appear to be pleasing, by a sprightly and interesting expression of countenance, though far from beautiful; their features have the peculiar characteristics of the Bushman race. This account is fully confirmed by Thompson, in his work entitled "Travels in Africa;" and Kolben, in his "Voyages and Natural History of the Cape of Good Hope," draws even a more favourable portrait of this race, undoubtedly the remains of Hottentot hordes who subsisted in other times like all the tribes of Southern Africa, for the most part, by rearing sheep and cattle, but who have been plundered of their birth-right by European settlers, and compelled to seek shelter among the impenetrable rocks and deserts of the interior. Flocks and herds they now have none; no longer a pastoral nation, the few remaining representatives of this ancient race live by hunting or upon the roots of the desert; on reptiles, locusts, the larvæ of ants, and the plunder obtained from the colonists on the frontier. Descended from the pastoral, to the state of banditti, the Bushmen have become transformed into hordes of fierce, suspicious, and blood-thirsty savages; treated by their fellow men, who claim the title of Christians, as bears or wolves, and hunted like wild beasts, they have at length become assimilated to

them in disposition and habits ; nevertheless the sun of humanity can be discovered peeping from beneath this black and degrading cloud, and the proofs of a nature allied to our own are clearly manifest.

They are, we are informed by one of the best writers on South Africa (Kolben), the most faithful servants in the world ; and although passionately fond of spirits and tobacco, will not partake of that which belongs to their masters, nor suffer any other person to do so : added to this, kindness and good nature are distinguishing traits of their character. "I have known many of them (says Kolben) who understood French, Dutch, and Portuguese, to a degree of perfection ; one particularly who learnt English and French in a very short time, and having overcome the habits of pronunciation contracted from his native language, was said by good judges to understand and speak them with surprising readiness and propriety."

It appears also that their chastity is very remarkable, and adultery when known among them is punished with death. They have been employed by Europeans in affairs requiring the exercise of skill and judgment. A Hottentot named Cloos was engaged to carry on a trade of barter for cattle, with tribes residing at a very considerable distance, by Van der Stel, a late governor of the Cape, and he generally returned after executing his commission with great success.

Such are the men who by some writers have been declared unworthy to form one of the links of the chain of human nature. It has been said also that the Hottentots are devoid of a knowledge of a future state, and that they are destitute of all belief in a Deity. The

internal character of the mind can be best discovered by an acquaintance with religious ideas and impressions. This evidence cannot easily be collected respecting tribes enslaved and cut off from their fellow men, and obliged to toil incessantly to procure the scanty supply of food on which they contrive to eke out existence. In such a state of being, and exposed to such vicissitudes, little surprise need be expressed, if all vestige of religious feeling, all veneration for justice, all traces of morality, are found to be obliterated. This, however, is not the case; the Hottentots have a firm belief in a supreme power, which they term "*Gounya, Tekquoa,*" or the god of all gods, saying his abode is far beyond the moon. No prayers are offered up to this deity—no sacrifices made—but the moon is worshipped at the full and change.

From the period when the Cape colony came into the possession of the English, great improvements have been made in the condition of this people, and through the exertion of Missionary labour many Hottentots and even Bushmen have embraced the Christian faith, and become converts to the sublime doctrines of our holy religion.

Little need be said of the *Esquimaux*. It would indeed be superfluous to do so, after the lucid manner in which their habits and customs have of late been described by numerous writers. Inhabitants of a portion of the earth where living nature appears continually at the point of death, buried under the ever present ice and snow of the pole, their employment is the chase, their occupation storing provisions in subterraneous storehouses in which they pass much of their time in

sleep, or in eating dried fish during the long wintry nights that the aurora-borealis but dimly cheers. Their feelings of justice and ideas of a future state may be collected from the journals of the Moravian missionaries. They believe in a future state, which is looked upon as the reward of the good, and suppose the great spirit Torngarsuc, to dwell in an Elysium placed in the abysses of the ocean. The first convert to the doctrines of Christianity was Kajarnack, who became a zealous disciple of the missionaries, and greatly assisted them in spreading his newly embraced creed. The effects of Christianity upon the moral and social condition of this people has been very remarkable. National superstitions no longer exist; the temple of sorcery is overthrown; cruelty and licentiousness, with a long train of kindred vices, are now replaced by neighbourly good feeling and Christian philanthropy. Thus in a very short period of time, has the mind of the Greenlander become softened and purified, although his mode of life is still rude, and destitute of the polish of civilization so striking in the inhabitants of Europe.

The Negro races are clearly distinguishable from Kaffer tribes in many important particulars; I therefore propose to submit them next to a psychological comparison. The materials for such an examination are very abundant, more so than of any other tribe, and it may be better at once to commence with the religion of the African Negroes. This race are usually described as bound by the spell of Fetisses, which means superstitions charms. This creed of spells holds a primary position in all the forms of religious worship among the

Negroes of Africa, but it does not appear that the first rays of a natural religion are altogether clouded by it. If the examination be extended to the nations of more temperate climes—to the polished inhabitants of France, England, and Scotland, or the sister kingdom, is not the prevalence of superstitions and practices, more or less bordering upon the Fetisses of the Negroes, at once discovered? Such, for example, as the doctrine of fatality; a belief in destiny, astrology, necromancy, charms, spells, omens, good and evil genius of particular individuals, lucky and unlucky days; to say nothing of a superstition greater than any existing amongst the poor deluded inhabitants of Africa—viz. the placing a child's caul in the cabin of a ship to preserve it from being wrecked; looked upon by our sailors with terror, and firmly believed by them the guardian angel that protects the ship from every danger. Barbot, who has written an account of "Guinea," remarks that the word Fetisso, signifying a spell or charm, is not an African term, although used by the Negroes of the Gold Coast, who borrowed it from the Portuguese. The names of their idols are Bossefoe and Bossum. In a voyage made by the Apostolical Prefect of the Jacobites, (Father Godfrey Loyer,) to the coast of Issini, he studied the manners, customs, and devotional exercises of this people, and declares that they have universally a belief in the existence of a God, and to that God their prayers are addressed. "Every morning," continues this writer, "after they rise they go to the river side, and either throw some water, or sand and water, upon their head in token of submission; they then join their hands, and open them, uttering softly the word

'Eksuvias;' this over, the eyes are raised towards heaven, and with great fervour they repeat the following prayer: '*Anghiùme mame maro mame vice, mame shike é okkori mame akaka mame bremlie mame unquan e aconsan.*'*

The celebrated missionary Oldendrop, (*Geschichte der Mission der Evangelischen Bruder auf den Carai-baischen Inseln St. Thomas, S. Croix, und S. Jan. 1777. s. 318.*) had many opportunities of forming a correct opinion of the habits of the Negroes, and appears to have availed himself of them; becoming thoroughly acquainted with their peculiarities of character and mental history. He prefaces his elaborate account with the pledge, that every thing contained in his works has been written in perfect good faith, and that every thing narrated came immediately under his own observation. Let him speak, however, in his own forcible language. "I recognized among them a universal belief in the existence of a God whom they represent as very powerful and beneficent. 'He is the maker of the world and of men, he it is who thunders in the air, as he punishes the *bad man with his bolts*. He regards beneficent actions with a smile, and rewards the pious with a long life.'" He also informs us that the above simple and beautiful creed was received by him from the Negroes, "for I have related nothing

* The translation of this prayer is—"My God, give me day by day yams and rice—give me gold and silver—supply me with riches and slaves—bestow upon me the blessings of health, and make me active and swift."

which I did not receive immediately from the Negroes themselves."

To this almighty Parent the Negroes ascribe their own personal gifts, the fruits of the earth, and all good things. They believe that he is favourable to such men as offer prayers to him, who call upon him in the hour of danger and in time of need, and that he succours them in peril, heals their diseases, relieves the parched earth with the refreshing shower and causes it to produce fruit. "This (say the Negroes) is the chief God who lives on high, beyond the sun; the God above all gods."

"Among all the black nations, (writes the excellent Oldendrop,) with whom I have been acquainted, *even among the utterly ignorant and rude, there is none which did not believe in a God, which had not learnt to give him a name, which did not regard him as the maker of the world, and ascribe to him, more or less clearly, all the attributes which I have briefly summed up.*"

It appears, however, that the Negroes have only one name for heaven and God; both are always designated alike. I cannot collect from the writings of Oldendrop whether they do or do not regard heaven and the God of heaven as the same. Perhaps their minds (poor unsophisticated children of nature) have never thought upon the difference. But although unable to collect positive evidence on this minor point, enough has been written to prove that the African Negro, the child of the desert, the inhabitant of the forest, the slave of the white *barbarian*, possesses a belief in a future state; a belief in the existence of a God, of mercy, and of justice, although he has been placed in the kingdom

of the brute, and denied by some to possess even the semblance of humanity.

Was additional proof wanted to establish the authority of the writer just quoted, it may be derived from the fact of his being frequently referred to by Dr. Prichard. Any one can discover, by a perusal of his work, that no opinion is there given which has not been fully examined; no author quoted whose views cannot be tested by the standard of truth.

Upon the authority of Oldendrop it may also be stated, that the Negroes believe almost universally in the happiness of the good after death, and imagine the abode of the blessed to be where Sambo Pringo (that is God) dwells. They fancy that the souls of bad men become ghosts, and reappear upon earth because they preserve their inclination to do evil, which proves that they have not gone to God.

“There is scarcely any nation of Guinea which does not believe in the immortality of the soul, and that it continues to live after its separation from the body; has certain necessities, performs actions, and is especially capable of the enjoyment of happiness or misery. The Amina call the soul and the shadow by the same name, and some of the Watje nation told me that ‘they consider the soul to be of as subtile a nature as is the shadow.’” *Oldendrop.*

It is a pleasing fact that evidence has been collected by this writer, and also by Crantz, which proves that the Negroes are as capable of receiving the divine light of Christianity as ourselves. He has collected numerous prayers and homilies composed by Negro preachers, addressed to congregations of their country-

men, breathing the same spirit of love to God and man as animated the men who composed the Liturgy of our holy religion ; and this proves them to be as capable of receiving instruction as our painted ancestors — proves them to possess powers of mind and body equal to our own—proves that the hour will come when the dark clouds of ignorance and superstition will be banished from their land—proves that an hour will come when the cross shall be conveyed to India—to Africa,—the blessing Christ brought with him from heaven ; when the devotee of the Ganges shall hear of the washing of regeneration, and the earth filled with the glory of God.

Mr. Lawrence remarks, that “ the inferiority of the dark to the white races is much more general and strongly marked in the powers of knowledge and reflection, the intellectual faculties, using that expression in its most comprehensive sense, than in moral feelings and dispositions. Many of the former, although little civilized, display an openness of heart, a friendly and generous disposition, the greatest hospitality, and an observance of the point of honour, according to their own notions, from which nations more advanced in knowledge might often take a lesson with advantage.

INDIVIDUAL EXAMPLES OF MENTAL SUPERIORITY IN THE NEGRO RACE.

The following instances of superior mental endowment in Negroes are collected from the writings of Blumenbach, Barrow, Lawrence, Le Vaillant, and Mungo Park. A few examples, however, can only be selected from the many anecdotes honourable to the

moral character of the Africans; proving them to be neither wanting in powers of mind, nor deficient in the more amiable qualities of the heart. The portrait of a chief of one of the tribes, is thus beautifully drawn:—
“ His countenance was strongly marked with the habit of reflection; vigorous in his mental, and amiable in his personal qualities, Gaika was at once the friend and ruler of a happy people, who universally pronounced his name with transport, and blessed his abode as the seat of felicity.”

Mr. Barrow, speaking of the Hottentots, informs us, that they are kind and faithful; that they would divide the last bit of bread with a friend; that they have little of the cunning of the savage, and when accused of any crime, if guilty, at once divulge the truth. They are of a very peaceful disposition, seldom quarrel or use provoking words, and are far from being devoid of talent. Many might learn a lesson from these savages.

During the dreadful earthquake which made such ravages in the island of St. Domingo in the year 1770, a Negress of Port-au-Prince, found herself alone in the house of her master and mistress, with their youngest child whom she nursed. The house shook to its foundation. Every one had taken flight, she alone could not escape, without leaving her infant charge in danger; she flew to the chamber and found it in a profound sleep, at that moment the walls of the house fell in; still anxious to save the child she threw herself upon it, and when the ruins were examined the babe was found alive, shielded and preserved by the mangled body of the faithful Negress, who died soon afterwards, he victim of her fidelity.

Blumenbach had at one time in his possession poetry in English, Latin, and Dutch, by different Negroes.

In 1734, *A. W. Amo*, a Negro from the coast of Guinea, took the degree of *Doctor* at the University of Wittenberg, and displayed in two disputations an extensive and well-digested reading in the physiological books of the time.

Ignatius Sancho and *Gustavus Vasa*, the former born in a slave ship on its passage to the West Indies, and the latter in the kingdom of Benin, have distinguished themselves as literary characters in modern times.

Jac. E. J. Capitein, who after studying theology, was ordained at Leyden, and published several works on divinity, was bought when only eight years old of a slave-dealer. His "*Dissertatio de Servitute Libertati Christianæ non contraria*," when first published, was considered a work of great merit and went through four editions.

Among the many amiable traits which distinguish the character of the American Indians, that of conjugal affection and fidelity is not the least remarkable. When a couple is married the husband takes considerable pains to please his wife, and by repeated proofs of his skill and ability in the art of hunting, to make her sensible that she can be happy with him, and that peace and plenty shall be her portion. At break of day he will take his gun, and by breakfast time return home with a deer, turkey, or some other game. He makes it appear, that it is in his power to bring provisions home whenever he pleases; and his wife, proud of having such a good hunter for her husband, does her utmost to serve and make herself agreeable to him.

The more a man does for his wife's comfort, the more he is esteemed. In the year 1762, (says Mr. Heckerwelder, in his very interesting account of the American Indians,) I was witness to a very remarkable instance of the disposition of Indians to indulge their wives. There was a famine in the land, and a sick Indian woman expressed a desire for a mess of Indian corn. Her husband having heard that a trader at Lower Sandusky had a little, set off on horseback for that place, one hundred miles distant, and returned with as much corn as filled the crown of his hat, for which he left his horse in pledge, and came home on foot, bringing his saddle back with him.

It very seldom happens that an Indian condescends to quarrel with his wife, or abuse her, though she has given him just cause. In such a case the man without replying or saying a single word will take his gun and go into the forest, where he will remain some weeks, subsisting upon the game he is enabled to kill, before he returns home again, well knowing that a greater punishment cannot be inflicted upon the wife for her misconduct than thus remaining away; for she is not only kept in suspense, uncertain whether he will return again, but is soon reported a bad and quarrelsome woman. When he at length does return, she endeavours by her attention to prove a penitence and sorrow for the past, though both studiously abstain from all mention of the cause of their late separation. And as his children will on his return hang about him and soothe him with their caresses, he is on their account ready to forgive, or at least to say nothing unpleasant to their mother.

If these traits in the character of the untutored Indian in domestic life put the manners of more civilized nations to the blush, how much more is the reproach to social life contained in the following narrative.

In the year 1771, (says the author last mentioned,) I passed by the door of an Indian who was a trader, and had consequently a quantity of goods in his house. He was going with his wife to Pittsburgh, and they were shutting up the house, so that no person remained in it during their absence. This shutting up was nothing more than putting a large pounding block with a few sticks outside the door so as to keep it closed. As I was looking at this man with attention while he was so employed, he addressed me in these words, "See, my friend, this is an Indian lock that I am putting to my door." I answered, "Well enough, but I see you have much property in the house, it may be stolen before your return." "Stolen by whom?" "Why by the Indians to be sure." "No, no—(replied he)—no Indian would do such a thing, and unless a *white man* happen to come this way, I shall find it quite safe on my return."

In 1731, an African youth named Job Ben Solomon, son of the high priest of Bunda in Forta, was made prisoner when travelling on the south side of the Gambia, and sold as a slave to an American captain, who carried him to Maryland. He was there resold to a planter, who, finding him a youth of very distinguished abilities, treated him with great kindness, and at the expiration of twelve months undertook to forward a letter written by the poor boy, in the Arabic tongue to the distinguished philanthropist, Mr. Oglethorpe, in

England, whose fame as a friend of humanity pointed him out as the most likely person to effect the restoration of an unfortunate captive to his native country.

On receiving this letter, Mr. Oglethorpe immediately sent out instructions for the ransom of Solomon, and his conveyance to England. When he arrived in this country every attention was paid to him; the Royal Family and nobles of the court treating him with the greatest kindness. After residing in London for about fourteen months, Job resolved to return to his native land; wishing once more to embrace the high priest, his father.

When he left England the Royal Family and African Company loaded him with presents, and directions were sent to their agents in Africa to show him every attention.

Job arrived at James Fort on the 8th of August, 1734, at which time Mr. Moore, then in the service of the African company, was at the place. A relation of what followed is extracted from the journal of this gentleman.

“Job Ben Solomon having a mind to go up to Joar to talk with some of his countrymen, accompanied me there.

“We arrived at the creek of Domofeusa, and having some acquaintance at the town of that name, Job and I went there together.

“In the evening, as we were sitting under a great tree, there came six or seven of the very people who three years before had stolen Job and sold him to the master of the slave-ship. Affecting not to know them, he asked some questions about himself, which they answered truly.

“ At last he enquired, ‘ how the King their master did ? ’ They answered, ‘ that he was dead. ’ ‘ Dead, ’ exclaimed Job, ‘ how did he die ? ’ ‘ Among the goods, ’ replied they, ‘ for which they sold poor Job there was a pistol, which the King used commonly to wear suspended by a string around his neck, and the pistol being loaded, accidentally went off one day, and the balls lodging in his throat he presently died. ’

“ Job was so transported at the close of this story, that he immediately fell on his knees and returned thanks to Mahomet, for making his persecutor die by the very goods for which he sold him into slavery.

“ He then turned to Mr. Moore, saying, ‘ You see, Mr. Moore, that God Almighty was displeased at this man’s making me a slave, and therefore made him die by the very pistol for which he sold me. Yet ought I to forgive him, because had I not been sold I should neither have known any thing of the English tongue, nor have had any of the fine, useful, and valuable things I have brought with me, nor have known that there is such a place in the world as noble England, nor such good and generous people as Mr. Oglethorpe, Queen Caroline, the Duke of Cumberland, the Duke of Montague, the Earl of Pembroke, Mr. Holden, and the Royal African Company. ’ ”

“ Father, ” said the Indian chief Captain Pipe, to the British commanding officer at Detroit in 1801, “ here is what has been done with the hatchet you gave me, (handing a stick with a scalp on it). I have done with the hatchet what you commanded me to do, and found it sharp. Nevertheless I did not do all that I might have done. *No, I did not ; my heart failed within me.*

I felt compassion for your enemy. *Innocence* (meaning women and children) *had no part* in your quarrel, therefore *I distinguished—I spared—I* took some live flesh (his name for prisoners), which while I was bringing to you, I spied one of your large canoes in which I put it for you. In a few days you will *receive the flesh and find it of the same colour as your own*, Father! I hope you will not destroy what I have saved. You, Father, have the means of saving these, which with me would perish for want. The warrior is poor and his cabin always empty, but your house, father, is always full.”

The above facts have not been brought before the reader with the view, either of asserting the mental superiority of the Negro family, or of proving them equal as a race to the inhabitants of European countries. Still we have found many of them possessed of the same powers of mind, as the most learned of our schools; we have discovered traits of kindness and benevolence, worthy the most exalted of our philanthropists; and when men are discovered so nearly allied in all the principal traits of their psychical character to each other, it cannot be denied that they are of the same species. For example, take two men, the one black, and the other white, who never saw or heard of one another, or ever held communion with, or received instruction from any other man, that could give them common notions; yet let them speak at the extremities of the pole, on certain truths, and the ideas will be the same. Men of all countries, and of all ages, whatever their education may have been, are agreed on certain truths. This innate essence is pos-

essed by all mankind ; it is this internal power which makes the African savage think about a great many things just as the Greek and Roman philosophers thought ; it is this power that made the Chinese geometricians find out some of the same truths as the Europeans, though a boundless ocean at one time cut off all communication, even the knowledge of the existence the one of the other. It is this power of the mind which makes the Englishman and the Hottentot conclude that two and two are four ; that makes men think on certain points now, as four thousand years ago ; that gives uniform thoughts to the most jealous and dissimilar of men, and the most irreconcilable among themselves ; it is by this power that men, in all ages and countries are, as it were, bound together in harmony, and chained to an immoveable centre, by certain invariable rules, termed first principles, notwithstanding the infinite variation of opinions that arise among them from their passions, avocations, and caprices, which even overrule all their other less clear judgments. It is by this power that men, depraved as they are, have not as yet presumed openly to bestow on *vice* the name of *virtue*, that they are obliged to dissemble, being just, sincere and moderate, in order to gain one another's esteem. The most depraved of men cannot be brought to value what they wish they could value, or to despise what they wish they could despise. It is not possible to force the eternal barrier of truth and justice. The universal faculty of reason checks the attempt, and sets bounds to the folly and imprudence of man. Though vice has reigned for ages with unbridled licentiousness, virtue is still called virtue, and the most brutal of her

adversaries cannot rob her of her name. Hence it follows, that vice, though triumphant throughout the world, is still obliged to disguise itself under the mask of hypocrisy, or to pretend honesty, in order to gain the homage it has not the confidence to expect. This feeling is shared by all men; it is recognized equally in the rude unlettered savages of New Zealand, as among the more refined and civilized nations of the earth.

“ How rude soe'er the exterior form we find,
Howe'er opinion tinge the varied mind;
Alike to all the kind indulgent heaven,
The sparks of truth and happiness has given.”

The proofs therefore which confirm the opinion of the mono-species of mankind, besides being derived from *Scripture History*, are supported on the physiological characters common to all the races of men; on the facility with which they pass into one another; on the power of the mixed progeny of any two of the races to increase their species; and on the diversities of the races being in all respects analogous to those deviations from a common type, which mark varieties in the progeny of a single race. Lady Mary Wortley Montague, in a letter to a French count, (translated from the French,) mentions, in her peculiar style, this important fact: “The suburbs of Pera, Tophana, and Galata, are collections of strangers from all countries of the universe. They have so often intermarried, that this forms several races of people, the oddest imaginable. There is not one single family of natives that can value itself on being unmixed. You frequently see a person whose father

was born a *Grecian*, the mother an *Italian*, the grandfather a *Frenchman*, the grandmother an *American*, and their ancestors *English*, *Muscovites*, *Asiatics*, &c.

“ This mixture produces creatures more extraordinary than you could well imagine, nor could I ever doubt but there were several kinds of men, since the whites, the woolly and the long-haired blacks, the small-eyed Tartars and Chinese, the beardless Brazilians, and (to name no more) the oily-skinned yellow Nova Zemblians, have as specific differences under the same general kind, as greyhounds, mastiffs, spaniels, bull-dogs, or the race of my little Diana, if nobody is offended at the comparison. Now as the various intermixing of these latter animals causes mongrels too, divided and subdivided into endless sorts, we have daily proofs of it here as I told you before. In the same animal is generally remarked the *Greek* perfidiousness, the *Italian* diffidence, the *French* loquacity, and all of a sudden he is seized with a fit of English thoughtfulness, bordering a little upon dulness, which many of us have inherited from the stupidity of our *Saxon* progenitors. But the family which charms me most is that which proceeds from the fantastical conjunction of a *Dutch* male with a *Greek* female. As these are natures opposite in extremes, 'tis a pleasure to observe how the differing atoms are perpetually jarring together in the children, even so as to produce effects visible in their external form. They have the large black eyes of the country, with the fat, white, fishy flesh of Holland, and a lively air streaked with dulness. At one and the same time they shew that love of expensiveness, so universal among the *Greeks*, and an inclination to the *Dutch*

frugality. To give an example of this: young women ruin themselves to purchase jewels for adorning their heads, while they have not the heart to buy new shoes, or rather slippers for their feet, which are commonly in a tattered condition; a thing so contrary to the taste of English women, that it is for shewing how neatly their feet are dressed, and for shewing this only, they are so passionately enamoured with their hoop petticoats. I have abundance of their singularities to communicate to you, but I am at the end of my French and my paper."

The reader is now in possession of the principal facts, from which the conclusion, that the different races of men, form but one genus and one species has been drawn. Looking at the varieties in form and colour, in intellectual endowments, and moral attributes, and giving the sceptic the benefit of every position he may think proper to take, the evidence adduced, remains rather strengthened, than shaken by the objections that have been raised. The question proposed was,—“are all men descended from one common parent?” The facts here recorded favour the affirmative conclusion. The wisest, the most learned, and best acquainted with the question, after the most minute examination answer, “Yes.” And looking at the question with a firm and honest resolution to declare the truth, the only answer that can be given, is that of the preacher—

“The black man is God’s image like ourselves, though carved in ebony.”

CHAPTER VII.



THE BRAIN AND NERVOUS SYSTEM IN MAN.

Οση γαρ φυλλων γενέη, τσηδε και Ανδρων.

HOMER.

Frail as the leaves that quiver on the sprays,
Like them man flourishes, like them decays.

DR. JOHNSON.

*Cum volet ille dies, quæ nil nisi corporis hujus
Jus habet, incerti spatium mihi finiat ævi.

OVID.

AT page 33 a brief sketch has been given of the formation of the brain in man and the inferior races of animals. On reading this portion of the work in its passage through the press, it appeared necessary to devote a little more attention to the formation of the brain in man, with a view of studying its peculiar functions.

* Come the day of death sooner or later, its undetermined period can only destroy our tenement of clay.

THE BRAIN AND NERVOUS SYSTEM.

An examination of this organ leads to the investigation of the animal functions. They are two-fold, consisting of feeling, and an exertion of the will. From this it is at once evident that they must be peculiar to animals. These functions are the offspring of certain organs known to anatomists by the names—

1. ENCEPHALON.
2. SPINAL CHORD.
3. NERVES.

The *encephalon* or brain is the inhabitant of the skull (*cranium*), and is the largest solid organ in the human body, with the exception of the liver. It is not very firm in structure, and in certain diseases, or upon exposure to the atmosphere, is converted into a soft kind of paste. It consists of two portions, the one *fibrous*, the other *pulpy*. The external portion is of various tincts, from a blue to a yellowish brown. The colour is not the same in all cases. The age of the subject whence it was taken—the state of health or disease of the organ, and other circumstances, tend to produce considerable changes. The larger portion is fibrous and white; it is therefore said by some to consist of a cortical or cineritious, and of a medullary or white portion. The definition of Gall is better, “one portion is *fibrous*, the other *pulpy*.” Four masses enter into its formation; one very large portion called the *cerebrum*; and a second (*cerebellum*), situate under the

posterior part of the cerebrum. These are united by a very small portion of brain, called the *mesocephalon*, (or tuber annulare, or pons Varolii.) There is another part of the brain only remaining to be noticed. This is the *chorda oblongata*, and this again is extended into the *chorda spinalis*, or marrow of the back.

The cerebrum is divided down its centre into two equal parts termed hemispheres, each containing three lobes (*anterior, middle, and posterior.*) The outermost part of the brain is rendered much more extensive by this beautiful arrangement—that is, the portion more nearly in contact with the skull. This part of the brain is highly important, for it is reasonable to conclude that the abode of chief functions is the more external parts. It is hardly reasonable to suppose that the whole brain, as one organ directs in common all the thoughts and actions of men; for if this were the case, how comes it that a man may be rational on every point save one, and on that one point a madman? This argument appears to go very far, (founded as it is upon a well established fact) to prove that certain portions of the brain are the abode of particular organs.

In the same way the *cerebellum* is divided into two lobes, and these into sixteen lobules; the surface of each lobe consists of about sixty plates standing side by side, and even in the sides of these are others, secondary, seen only on separating the primary, and amounting perhaps to six or seven hundred. “The purpose (says Dr. Elliotson) must be the same;” we also find the surface further augmented by cavities, and the surface of these cavities also increased by irregularities.

FUNCTIONS OF THE BRAIN IN MAN.

Many authors have remarked that a gradation* exists among all the objects of the universe from the Almighty Creator through archangels, and angels, men, brutes, shapeless, and inanimate matter, even down to nothing.

This gradation, striking as it doubtless is, will on minute examination be found neither regular nor insensible. "The highest being (as Dr. Johnson well remarks) not infinite, must be at an infinite distance from infinity; and in this distance between *finite* and *infinite*, there will be room for ever, for an infinite series of indefinable existence. Between the lowest positive existence, and nothing, wherever we suppose existence to cease, is another chasm infinitely deep; where there is room again for endless orders of subordinate beings, continued for ever and ever, and yet infinitely superior to non-existence; nor is this all; in the scale, wherever it begins or ends, are infinite vacuities. At whatever distance we suppose the next order of beings to be above man, there is room for an intermediate order of beings between them, *and if for one order, then for infinite orders*; since every thing that admits of more or less, and consequently all the parts of that which admits them, may be infinitely divided. So that as far

* In one of the first chapters, speaking of the uniformity of nature, the term, "*regular and hardly perceptible gradation*" is used. What it was intended to convey by such expression will be better understood by a perusal of the above remarks.

as we can judge, there may be room in the vacuity between any two steps of the scale, or between any two points of the cone, for infinite exertion of infinite power.”*

This train of thought leads us to remark the great distance at which the mental properties of man place him above the most sagacious beast. Gradation, it is true, must be admitted, but it is far from insensible, nor does it imply that the highest step in the ladder of existence is occupied with a more perfect being than the lowest, because the thistle and house-fly are as perfect, “after their kind,” as man, and it is only by the possession of his immortal mind that man stands on the pinnacle of terrestrial perfection. Vegetables, in addition to the properties of inanimate matter, contain those of life, viz. sensibility, without consciousness or perception. I would define it “excitability,”† for sensibility without the power of sensation is nonsense. Animals in addition to this enjoy mind, which includes the powers of consciousness, perception, and volition; consciousness expressive of that power by which the mind takes cognizance of internal—perception of external impressions. The possession of mind by animals implies the presence of a brain for its exertion, and nerves for the purpose of conveying impressions to it, and volitions from it, to one or more muscles placed under the dominion of the will.

* Free Enquiry into the Nature and origin of Evil, by Dr. Johnson.

† Dr. Elliotson.

“ Man (says Dr. Elliotson) besides the common properties of animals has others which raise him to an immense superiority. His mind is endowed with powers of the highest order which brutes have not, and his body being, like the bodies of all animals, constituted in harmony with the mind, that the powers of the latter may have effect, differs necessarily in many points from the body of every brute.”

“ What a piece of work is man !

How noble in reason ! how infinite in faculties ! in form and moving how express and admirable ! in action how like an angel ! in apprehension how like a god ! the beauty of the world ! the paragon of animals ! ”*

We have already found man distinguished from animals by the possession of reason—found that

“ Smiles from reason flow
To brute denied ; ” †

for the least examination proves the existence of the greatest differences between man and the brute creation. These differences have already been reviewed under two grand divisions—

1. *The mental faculties of mankind ;*
2. *The corporeal characteristics of mankind.*

* Hamlet, Act II.

† Milton's Paradise Lost, Book X.

1. Of the former, the necessity for the examination of them in comparison with the instincts of animals was insisted upon, in order to discover how exalted above the brute is the meanest savage. A stone and a seed, when viewed at a distance, may appear similar; but place them in the ground, and test their qualities. The one remains hidden in the earth; the other branches forth into a tree. So may the poor Indian remain ignorant, and appear at first sight little inferior to a monkey. But test them too, by the standard of education, and the savage will prove that he possesses the powers of our nature, which will gradually develope their noble superiority—the monkey will remain for ever what he was.

2. The corporeal characteristics of man are not less evident. Among the beings beheld by Satan in Milton's Paradise—

“ Two of far nobler shape, erect and tall,
God-like erect, with native honour clad,
In naked majesty seem'd lords of all.”

This erect posture is peculiar to all the races of men; nor can we conceive any reasonable man, supposing a word of truth to exist in the accounts that have been written of men wandering upon “all-fours,” in a wild and solitary state. This idea is exquisitely ridiculed in Hudibras.

“ Next it appears I am no horse,
That I can argue and discourse,
Have but two legs and ne'er a tail—
Quoth she, that nothing will avail;

For some *philosophers* (?) of late here
 Write, men have four legs by nature,
 And that 'tis custom makes them go,
 Erroneously but upon two ;
 As was in Germany made good,
 B' a boy that lost himself in a wood,
 And growing to a man was wont
 With wolves upon all fours to hunt."

" While some perversely (says a modern writer)* desirous of degrading their race, have attempted to remove a splendid distinction by asserting that we are constructed for "all-fours;" others with equal perverseness and ignorance have asserted that monkeys are destined for the upright posture.† That they maintain the erect posture more easily than other animals, is undoubtedly true ; but they cannot continue in it long, and while in it, bend their knees and body ; are insecure and tottering, and glad to rest upon a stick ; their feet too, instead of being spread for support are coiled up, as if to grasp something. In fact, their structure proves them to be neither biped nor quadruped, but four-handed animals. They live naturally in trees, and are furnished with four hands for grasping the branches, and gathering their food. Of their four hands, the posterior are the more perfect and never destitute of a thumb, although like the thumbs of all *Quadrumana*,

* Dr. Elliotson ; Human Physiology, part i. page 11.

† " Oh ! that man will put an enemy within his mouth to steal away his brains." To argue thus, man must be either intoxicated or mad.

so insignificant, as to have been termed by Eustachius "omnino ridiculus," whereas the anterior hands of one variety (*simia paniscus*) are destitute of this appendage. The whole length of the ourang-outang, it may also be mentioned, falls very short of ours."

"Man thus distinguished from all other terrestrial beings, evidently constitutes a separate species. For a species (says Cuvier) comprehends all the individuals which descend from each other as from a common parent, and those which resemble them as much as they do each other, and no brute bears such a resemblance to man."*

I shall now proceed to offer some remarks on the faculties, of the existence of which Gall fully satisfied himself. Such faculties as a matter of course depend upon the brain.

MENTAL FUNCTIONS OF THE NERVOUS SYSTEM.

- I. THE INSTINCT OF GENERATION.
- II. LOVE OF OFFSPRING.
- III. THE DISPOSITION TO FRIENDSHIP.
- IV. COURAGE.
- V. THE INSTINCT TO DESTROY LIFE.
- VI. CUNNING.
- VII. THE SENTIMENT OF PROPERTY.
- VIII. PRIDE.

* Cuvier. *Discours Preliminaire aux Recherches sur les Ossements, Fossiles des Quadrupeds.*

- IX. VANITY.
- X. CIRCUMSPECTION.
- XI. SENSE OF THINGS.
- XII. SENSE OF LOCALITY.
- XIII. SENSE OF LANGUAGE (philological talent).
- XIV. SENSE OF THE RELATION OF COLOURS.
- XV. SENSE OF THE RELATION OF NUMBERS.
- XVI. SENSE OF PERSONS.
- XVII. SENSE OF WORDS.
- XVIII. SENSE OF CONSTRUCTION.
- XIX. SENSE OF THE RELATION OF TONES.
- XX. COMPARATIVE SAGACITY.
- XXI. METAPHYSICAL SAGACITY (or Examination of Cause and Effect,)
- XXII. WIT.
- XXIII. POETIC TALENT.
- XXIV. GOODNESS.
- XXV. FACULTY OF IMITATION.
- XXVI. RELIGIOUS FEELING.
- XXVII. FIRMNESS.*

Gall is of opinion that the faculties enumerated in the above table are distinct and primitive, not mere

* Anatomie du Cerveau. Dr. Spurzheim (who is said by Dr. Elliotson and other writers, to have copied many pages from his great master (Gall) without acknowledgment, and who certainly appears to claim the honour of discoveries he never made, (as clearly proved by Drs. Dancey and Fossati,) gave to many of the above faculties new titles. Many of his new-coined words are, if not counterfeit, of very base metal. Dr. Vimont thus gives his opinion of them, "*Des expressions ridicules.*"

modifications of each other. But let him speak for himself.

“ An instinct, inclination, sentiment, or talent, requires the denomination of fundamental, primitive, radical—

“ I. When a quality or faculty (or its organ) is not manifested nor developed, nor diminished, at the same time with the others. Thus the instinct of generation (with its organ), is generally developed and manifested later than other inclinations. Thus the memory of names grows weak sooner than the other faculties.

“ II. When in the same individual a quality or faculty is more or less active (and its corresponding cerebral part more or less developed) than the others. Thus the greatest *sculptors, painters, designers*, have sometimes not the least disposition to music; the greatest poets little talent for mathematics.

“ III. When a single quality or faculty is active, whilst the others are paralyzed, (and only the corresponding organ developed). Thus persons imbecile in every other respect, are often violently impelled by physical love, or have a great talent for imitation, &c.

“ IV. When all the other faculties and qualities being active, (and all the other organs sufficiently developed,) one single quality or faculty is inactive, (and one single organ not developed). Thus certain individuals cannot comprehend that two and two make four; others detest music or women.

“ V. When in mental diseases, one quality or faculty only suffers or one is entire. Thus one insane person is mad only with regard to religion, to pride, &c.; another, although mad in every respect, still gives lessons in music with great intelligence.

“ VI. When the same quality or faculty is quite differently manifested in the two sexes of the same species of animal, and the organ is differently developed in the two. Thus, the love of offspring (with its organ) is more developed in the *females* of most animals; thus among singing birds the male only sings, (and has the organ well developed.)

“ VII. Lastly, when the same quality or faculty (and the same organ) always exists in one species and is deficient in another. Thus, many species of birds, the *dog* and the *horse*, &c., have no organ of construction, though this is so strikingly manifested in other kinds of birds, in the *squirrel*, and also in the *beaver*. Thus certain kinds of animals are pedaceous, migrate, sing, take care of their young; while other kinds are frugivorous, lead stationary lives, do not sing, abandon their offspring.*”

DIVISION OF MEN BY GALL INTO SIX CLASSES.

This division of course is made in regard to man's moral and intellectual faculties.

“ In the first class the qualities and faculties which are the most elevated and which are peculiar to man, are completely developed, while the organs of the animal qualities have but a feeble degree of development and activity.

“ In the second class the organs of the animal faculties and qualities have attained to a high degree of

* Vide Gall, b. c. t. iii. p. 213, sqq. et 4to. vol. iii. p. 81.

activity, while the organs of the qualities and faculties peculiar to man are but little developed and but little active.

“ In the third class, the qualities and faculties common to animals and those peculiar to man have considerable development.

“ In the fourth class only one or some of the indications or talents is developed in an extraordinary degree, while the rest have only a moderate development and activity, and are perhaps below mediocrity.

“ In the fifth class, one or some of the organs are but little developed and remain inactive, while the others are more favourably developed and active.

“ Finally, in the sixth class, the organs common to animals and those peculiar to man are almost equally moderate.”

Such is a brief outline of the opinions of this highly gifted physiologist. My limits forbid a critical examination of his creed; nor do I consider myself justified in attempting to enter the field of disputation with one whose opportunities for observation were so great; who spent a life in examining the relation between cause and effect, and whose writings prove him to have been, not only a very accurate observer of nature, but also a faithful recorder of what he saw. I never read a book more distinguished for a love of truth than this; and cannot but lament the injustice with which he has been treated. “ Few anatomists and physiologists (says Dr. Elliotson) have any idea of the errors as to facts, and the poverty of argument displayed by Cuvier, Tiedeman, Pinel, Esquirol, Richerand, Carus, Rudolphi, Serres, &c., and would be amply repaid by reading their exposure by Gall in various parts of his works.”

It appears clear that the brain is the organ of the mind, and more than probable that particular* portions have different offices. It appears also that many old writers have assigned, in the most fanciful manner, situations for the faculties; and, from regarding† as distinct faculties what are merely modes of faculties to which they were altogether strangers, their assertions on the subject were as groundless as ridiculous. Burton is guilty of this absurdity; for example, we find him saying, (in his compilation,) “*inner senses are three in number*, so called because they are within the *brain-pan*, as *common sense, phantasy, and memory*.” “Of common sense the forepart of the brain is the seat; of phantasy or imagination, which some call *estimative* or *cogitative*, his organ is the middle cell of the brain; and of memory, his seat and organ the back part of the brain.”‡ This was the account of the faculties, given by Arabian

* Be it remembered, that the brain consists of two portions; the operations of the two halves proceeding alike, just as the double impressions on the eyes and ears are known only as one; so one side of the brain may be much diseased without injury to the mind. One of Gall's friends, a physician, often complained that he could not think with the left side of the head; the right side was one inch higher than the left. Gall attended a gentleman who for three years heard peasants insulting him on the left side: he generally discovered and corrected his error. Tiedeman relates the case of a Moor who was alienated on one side of his brain, and observed his madness on the other. Mr. Coombe, in his *System of Phrenology*, mentions similar cases.

† Dr. Elliotson on the Mental Properties of the Nervous System, page 363.

‡ Anatomy of Melancholy.

authors* and repeated with little variation by the European writers of the middle ages. In the thirteenth century, a skull divided into regions was designed by the celebrated *Albertus Magnus*, bishop of Ratisbon,† and another was published by *Petrus Montagnana* in 1491. One also appeared in 1562 at Venice, by *Ludovico Dolce*, a Venetian, in a work upon strengthening and preserving memory, (a copy of which is in the possession of Dr. Elliotson,) and another at Bologna in 1670, entitled *Apologia Fisonomica*, by *Ghiradelli Bolognese*. In the British Museum is a chart of the universe and the elements of all sciences, and in it a large head so delineated, is conspicuous. "It was published at Rome (says Dr. Elliotson,) so late as the year 1632, and, what is singular, engraved at Antwerp by Theodore Galleus, and the head is really a good family likeness of Dr. Gall, who, however, was born at Tiefenbrum in Suabia, between Stuttgart and the Rhine, March 9, 1758."

Few doctrines have been more attacked than phrenology, the ground for the most part taken being its supposed incompatibility with the Christian religion. The question more particular before us is this—is the doctrine true? If so, phrenology must be in harmony with the revealed doctrines of God, because it is quite impossible that God's works can contradict his written word. That the mind (*speaking of mind and sense in*

* Gall, 4to. vol. iv.

† In the Tesorretto, of Brunetto Latini, the teacher of Dante, the doctrine is taught in rhyme.

their purely metaphysical spirit) is the offspring of the brain,* no reasonable man can doubt, and that *the mind* is affected by changes of the system, and certain conditions of the brain, is a fact that cannot be controverted. But this admitted connexion of mind with matter, does not injure one article of our faith, or deprive us of one iota of our *great hope*. There is no cheaper way of gaining credit for intense morality and devotion, than to cry "*materialist*" against all who speak of sense as connected with matter, and to brand with the title of *infidel* the man, who having studied the laws of life refers the senses to the vital actions that go on in the particular organs by which they are called forth. Does such an admission destroy the hope of a future state? Not at all. Our only foundation for the hope of happiness hereafter, is based upon the word of God—a much more secure foundation, than the sandy shores of metaphysical argument. We know that "this corruptible shall put on incorruption," "this mortal immortality," because it is so recorded in the word of God; and on this alone can we fix our hopes of a future state. "Christ is risen from the dead, and become the first fruits of them that slept. For since by man came death, by man came also the resurrection of the dead. For as in Adam all die, even so in Christ shall all be made alive."†

Mr. (now Lord Jeffrey) after glancing at an English work, (for I am certain he never could have read it with at-

* If not the offspring closely connected with it.

† St. Paul's First Epistle to the Corinthians, chap. xv.

tention; by no means an uncommon plan with reviewers,) by Dr. Spurzheim, in the Edinburgh Review (1815) wrote at once a most violent article, declaring “the *whole doctrine, anatomical, physiological, and physiognomical, a piece of thorough quackery from beginning to end.*” What particular school of anatomy his Lordship graduated in does not appear so clearly, as the want of that love for truth, which ought ever to guide the opinions we may form. “A candid mind will scorn to make use of false reasoning, even in defence of the truth;”* and a desire to draw a just conclusion, might have taught this Reviewer, how little his knowledge of the subject fitted him for the self-imposed task;† and yet with wonderful self-complacency he continues—“to enter on a particular refutation would be to insult the understanding of readers;” as Gall’s “opinions on the functions in general of man, and on his intellectual faculties in particular, are a collection of mere absurdities, without truth, connexion, or consistency; an incoherent rhapsody, which nothing could have induced a man to present to the public under a pretence of instructing them, but absolute insanity, gross ignorance, or matchless assurance.” “Still there is nothing so impossible but *mountebanks* will undertake, nothing so incredible but they will affirm.” “And (continues Lord Jeffrey), such is the trash, the despicable trumpery, which men calling themselves scientific enquirers have

* Campbell’s “Lectures on Pulpit Eloquence.”

† “Proprium est stultitiæ aliorum vitia cernere, oblivisci suorum.”—Cicero.

the impudence gravely to present to physiologists in the nineteenth century." The classic Quarterly Review,* assisted by the able pen of a dignitary of the church, in a strain scarcely less *pure* than the above, styles Gall "an ignorant and interested quack;"—"phrenology sheer nonsense, and Dr. Spurzheim a fool." Blackwood's Magazine foretold that "phrenology would be forgotten as soon as Dr. Spurzhiem left Edinburgh."† The Literary Gazette once pronounced "Der Freischutz a failure;" "we much doubt if there be a single air that will become popular."‡ How alike, the fate of the science and the opera!

Such are the opinions of learned reviewers. To enter on a *particular refutation* of such opinions would truly be "*an insult to the reader*." The remarks of Gall, however, on the reception of his opinions, can never be read without interest.||

"The followers of the different schools of philosophy among the Greeks, accused each other of impiety and

* No. XXV.

† 1817.

‡ July 24, 1824. No. 392. The Literary Gazette also was as loud in its condemnation of phrenology as the opera of Der Freischutz.

|| The Edinburgh Review, No. XIV. contains this observation:—"The discoverer of the circulation of the blood suffers no *diminution* of his *reputation* in our day from the *incredulity* with which his doctrine was received by some, the *effrontery* with which it was claimed by others, or the *knavery* with which it was ascribed to former physiologists." This remark applies with equal force to Gall.

perjury. The people in their turn detested the philosophers, and accused those who investigated principles with presumptuously encroaching upon the rights of Deity. The novelty of the opinions of Pythagoras caused his banishment from Athens; those of Anaxagoras threw him into prison; the Abderites treated Democritus as a madman, because he dissected dead bodies to discover the cause of insanity, and Socrates for demonstrating the unity of God.

“ The same scandal had been renewed at all times and in all nations. Many of those who distinguished themselves in the fourteenth century by their knowledge of natural things were put to death as magicians. Galileo, for proving the earth's motion, at the age of seventy was imprisoned. Those who first maintained the influence of climate upon the intellectual character of nations, were suspected of materialism.

“ Universally, nature treats new truths and their discoverers in a singular but uniform manner. With what indignation and animosity have not the greatest benefits been rejected? For instance, *potatoes*, *Peruvian bark*, *vaccination*, &c. &c. As soon as Varolius made his anatomical discoveries, he was decried by Sylvius as a most ignorant and infamous madman. Varolius was reproached with dazzling his auditor by a seductive eloquence, and artificially effecting the prolongation of the optic nerves as far as the thalami. Harvey, for maintaining the circulation of the blood, was treated as a visionary; and depravity went so far as to attempt his ruin with James, and Charles the First. When it was no longer possible to shorten the optic nerve, or arrest the course of the blood, then these discoveries were all

at once given to Hippocrates. The physical truths discovered by Linnæus, Buffon, the pious philosopher Bonnet, by George Le Roy, were announced as impieties likely to ruin religion, morality, and virtue. Even the liberal and generous Lavater was treated as a fatalist and a materialist.

“ This is a faithful picture of what has happened to me. I have therefore some reason to be proud of having experienced the same lot as men to whom the world is indebted for so great a mass of knowledge. It seems that nature has subjected all truths to persecution, in order to establish them the more firmly; for he who can snatch one from her, always presents a front of brass to the darts hurled against him, and has always force enough to defend and establish it. History proves that all the efforts and sophisms which are directed against a truth once drawn from darkness, fall like dust blown by the winds against a rock.

“ The instance of Aristotle and Descartes should be particularly quoted, when we wish to display the influence of prejudice upon the good or bad fortune of new doctrines. The opponents of Aristotle burnt his books; afterwards the books of Ramus, who had written against him, were burnt, and the opponents of the philosopher of Stagira declared heretics; and it was even forbidden by law to dispute his doctrines, under pain of being sent to the Galleys. Now there is no longer any discussion about the philosophy of Aristotle. Descartes was persecuted because he taught the “*innateness of ideas*,” and the University of Paris burnt his books. He had written the most sublime thoughts upon the existence of God. Voet accused him of

Atheism. Afterwards this said University declares itself in favour of innate ideas; and when Locke and Condillac attacked innate ideas, the cry of materialism and fatalism resounded on all sides.

“ Thus, the same opinions have at one time been regarded as dangerous, because they were new, and at another useful, because they were ancient. We must therefore pity mankind, and conclude that the opinions of contemporaries as to the truth or error, and dangerous or innocent tendencies, of a doctrine, are very suspicious, and that the author of a discovery should only be anxious to ascertain whether he has really discovered a truth or not. A truth once discovered will make its way, and not fail to produce good effects. ‘ Reason,’ says Ancillon after Bonnet, ‘ knows no useless nor dangerous truths; what is, is.’ This is indisputable, and is the only answer to be made to those who, putting all things in subordination to men’s wants, ask, what is the use of that? and to those who, always yielding to fear, ask, what may that lead to? Jesus, the son of Sirach, had already said, ‘ we ought not to ask what is the use of that: for the use will have its reward in time.’ ”

What Gall here remarks is undoubtedly true. Sydenham, whose memory all men honour, was called a *quack*, and a murderer, and this too by men whose dust is now without a name. If the illustrious father of modern philosophy was not vilified and imprisoned like Galileo for boldly announcing truth, he was represented by Cecil to Elizabeth, when she thought of making him her solicitor-general, “ as a man of mere speculation,—as one wholly given up to philosophical

inquiries,"—" *new indeed and amusing, but fanciful and unsound*, and therefore more likely to distract her affairs, than serve her carefully and with proper judgment."

But why multiply instances of the rejection of the most important truths, simply because they were new; or because learned reviewers were ignorant of the nature of that concerning which they thought fit to write? Was not the introduction of Greek once opposed at Oxford with violence, though now taught there as one of the most necessary things that a well-educated man can know? Was not the Newtonian theory once despised? Did not Father Pardies write against "the experiments and hypotheses of this great man?" Dr. Chalmers remarks (speaking of the Newtonian philosophy), "authority scowled upon it, and taste was disgusted by it, and fashion was ashamed of it." Was not the music of Handel rejected by his countrymen? Nor was its great merit acknowledged by them till it had delighted the enraptured English for more than a century. Was not this the fate too of Horace? Were not his Odes despised because they were new? The public he said—

" Nisi quæ terris semota, suisque
Temporibus defuncta videt, fastidit et odit;
Est vetus atque probus centum qui perficit annos."

Keep in mind in any examination of the subject, the fact that every faculty of the brain was given for a good purpose. Happiness is "our being's end and aim;" not individual, partial, temporary happiness of the

greatest number; but sound morality in individuals and commonwealths. No act can be virtuous that does not lead to the greatest happiness in the individual, or of the greatest number of individuals, nor can any act be for the benefit of a nation that is not based on virtue. "All the faculties (says Gall) are *good*, and necessary to human nature, such as it should be, according to the laws of the Creator. But I am convinced that too energetic an activity (*that is an improper use of*) of certain faculties *produces vicious inclinations—causes the primitive destination of propagation to degenerate into libertinism*; the sentiment of property into an inclination for theft; circumspection, into irresolution and a tendency to suicide; self-love into insolence, disobedience, and so on."*

The law of nature appears to consist in the proper employment of our faculties; by doing so happiness is secured; for if we disobey, we are certain to bring upon ourselves punishment. When man attempts to act contrarily to the law of nature evil sooner or later arises to ourselves. To obey then becomes a solemn duty, for Christianity teaches those precepts by which the greatest amount of happiness may be secured.

The brain must be regarded as the organ of the mind. By means of the spinal chord and nerves it contracts the voluntary muscles, influencing every other part of the body, and receiving impressions from every other part. If the nerve supplying the tongue is divided, this organ is deprived of the sense of taste;

* Gall, h. c. 4to. vol. iii. p. 31.

divide the optic nerve, and the eye no longer continues illumined with the rays of light. Cut off all communication with the brain—divide the nerves of sense and volition (as the fifth and spinal nerves)—cut away the nervous bands which convey impressions from, and volition to the brain, and the part so supplied is dead alike to sensation and motion. The formation of the brain of course varies in different animals.

“ In birds the two hemispheres are already more considerable, although distinct convolutions can be discerned. The cerebellum still consists merely of its middle or fundamental part; but already appears composed of many rings placed side by side.

“ In the small mammalia, the shrew-mouse, mouse, rat, squirrel, weasel, &c., convolutions are not yet discoverable. But as they are already distinctly found in other larger rodentia, the beaver, kangaroo, &c., we may suppose that they equally exist in them.

“ In the larger mammalia, the cat, polecat, marten, fox, dog, ape, the convolutions are more distinct and numerous, but their form varies according to the species.

“ In the dolphin, elephant, and man, they are more numerous and deep, than in the beaver, kangaroo, cat, &c., and their form and direction vary completely according to the species.

“ In all the mammalia, the cerebellum possesses, besides the middle or fundamental part, two lateral parts, which are more or less complicated, according to the species; and as the *soi-disant* pons varolii, or the *soi-disant* cerebral ganglia, *i. e.* the transverse layers of nervous bands, are only the commissure or junction of the lateral parts of the cerebellum, they are found in all the mammalia, and in none of the ovipara.

“ The number of the integral parts, or of the convolutions of the brain, varies equally in the different species of mammalia; in some, the anterior lobes of the hemispheres are larger or more elevated; in others, again, the inferior parts of the anterior lobes are nearly wanting. The middle lobes, and the other convolutions, present similar varieties.

“ In this way, the integrant parts of the brain augment in number and developement, as we pass from a less perfect to a more perfect animal, till we arrive at the brain of man, who, in the anterior-superior, and in the superior region of the frontal bone, possesses several parts of which other animals are deprived, and by means of which he is endowed with the most eminent qualities and faculties, with reason, and the feeling of religion and the existence of God.” *Gall.*

I have spoken of the mind as connected with the living brain; at the same time let it not be implied that it is asserted, that *mind is material, for a power or property of matter cannot be matter.* Neither is it an assertion that this power cannot be something immortal, subtle, immaterial, diffused through, and connected with the brain. That it is independent of the brain is clear, *for it will continue to exist when the brain shall be restored to its pristine dust.* As a physical inquirer, I have found this power of thought connected with the brain, nor can I see any reason for supposing that the brain does not possess the power of thought, because it is medullary matter; surely the God who made the organ could supply this faculty. Admitting the brain to possess the power of thought—what then? Is the grand distinguishing feature given in the table of att:i-

butes peculiar to man to be erased? Certainly not. There are many things we cannot prove, which nevertheless are certain. "I have no hope (says Dr. Watson) of a future existence except that which is grounded on the truth of Christianity."*

On a subject like this, all argument is useless. The attempts to prove the separate existence of a soul by the power of reason, learned as they are, tend rather to confuse than to instruct; seem ever to render "darkness more visible." We must therefore turn for instruction to the word of God, and of it I would say, as Cicero said of the twelve tables: this little book alone exceeds the libraries of all the philosophers in the weight of its authority and in the extent of its utility. This is a guide well worthy the attention of the scientific inquirer; a book which afforded matter for the laws of Solon, and a foundation for the philosophy of Plato, and which has ever been admired for its piety, its veracity, and its sublimity. It has withstood the learning of Porphyry and the power of Faustus—it has resisted the genius Bolingbroke, and the wit of Voltaire; to say nothing of Paine and a herd of inferior

* "As a Deist I have little expectation, as a Christian I have no doubt of a future state."—Apology for the Bible, Letter 10. By R. Watson, D.D. late Lord Bishop of Llandaff.

"Consequently that the whole man becomes extinct at death, and that we have no hope of surviving the grave but what is derived from the scheme of Revelation."—Dr. Priestley.

"I know of no arguments to prove the immortality of the soul but such as we derive from the Christian Revelation."—Medical Enquiries by Dr. Rush.

assailants, who barbed anew the blunted arrows of former adversaries; feathered them with blasphemy and ridicule, dipped them in the deadliest poison, and aimed them with their utmost skill, and yet it fell not. The word of God remains, "the gates of hell prevail not"—the darts of the evil one, like the feeble javelin of old Priam, fall short of the mark, and leave no trace behind.

On a point of this kind the reader must form his own opinion. I confess my ignorance, my inability, as an anatomist and physiologist, to unravel the mystery. The learning of the schools has taught me nothing save the feebleness of man, and my own incompetency to search out the ways of the Omnipotent. And yet how certain the hope of immortality—how clear the demonstration of the existence of an immaterial soul, resting as it does on the pages of that gospel, "which has brought life and immortality to light."

CHAPTER VIII.

DR. MORTON'S "CRANIA AMERICANA."

ANY treatise professing to investigate the varieties observed in the formation of the different races of men, would in the present day be deemed incomplete, were some mention not made of the volume before us. This work ("Crania Americana"), which is illustrated by seventy beautiful engravings, ranks in the highest class of transatlantic literature; nor can a careful examination of it be completed, with the view of analyzing the opinions of Dr. Morton, without experiencing a pleasure of no ordinary nature. For my own part, I rose from a perusal of this book possessed of much valuable information, not previously obtained, and of many valuable facts, tending to confirm the truth of the opinions I long ago ventured publicly to express—viz. that the races of men, whatever their difference in stature, colour, civilization, and language, constitute nevertheless but one genus and one species.

Not the least interesting portion of this work are the observations on the Negro race; and when we remember the brutal manner in which the black man is still treated by the Americans, it is pleasing to see their cause so ably advocated by an inhabitant of that country.

The term Ethiopian is in common use to designate the Negro, yet very improperly, inasmuch as this name was given by the ancients not only to certain parts of Eastern Africa, including Nubia and Abyssinia, but also to Southern India, and moreover was applied to any country whose inhabitants were of a very dark colour. "The Greeks," says Sir W. Jones, "called all the southern nations of the world by the common appellation of Ethiopians, thus using Ethiop and Indian as convertible terms."

The NEGRO FAMILY may be said to embrace all the proper Negro nations near and south of Mount Atlas and Abyssinia, to the country inhabited by the Caffers and Hottentots. In the more northern tribes various mixed features are observed which their proximity to the Caucasian nations fully accounts for. "The people of Elwah," says Browne, "are quite of Egyptian, or Arab complexion and feature, and none of them black; so that I scarce conceived myself to have arrived at the confines of the blacks till we reached the first inhabited parts of Dartfour.* In like manner the Foulahs, who inhabit the Atlantic coast in the same parallel of latitude, are of a brown complexion, with long hair and European features; but these tribes are obviously, in part, of Moorish descent, and are supposed by some to be the Leucæthiopes of Ptolemy.

"The characteristics which have already been adverted to, are so uniformly bestowed, that among the thousands of Negroes of many different nations whom I

* Travels in Africa.

saw in the West Indies, not one could have been mistaken for an individual of another race.”*

It appears also that the moral and intellectual character of the Africans is widely different, in different nations. Their institutions, like most other uncivilized tribes, are characterized by cruelty and superstition; they are fond of warlike enterprises, and not wanting in personal courage. When conquered, however, they are said to yield at once to fate, and with great facility accommodate themselves to every change of circumstance.†

The Negroes have little invention, but strong powers of imitation, so that they readily acquire the mechanical arts. They have a great talent for music, and all their external senses are remarkably acute. Their intellectual character, in regard to which there is much diversity of opinion, has already been examined.

The CAFFRO-AFRICAN FAMILY is interposed between the Hottentots on the south, and the common Negroes on the north. Caffer is the name by which Europeans generally distinguish them—*Amakosa* however appears to be the true name. Caffer is an Arabic word, signifying *infidel*. South of the Caffers dwells the AUSTRAL-AFRICAN FAMILY, bearing the nearest resemblance to the brute creation; and yet how clear are the distinguishing features, how wide the distance separating them from each other.

* Travels to the Source of the Niger.

† Prichard's Researches, vol. i. Murray's Travels in the United States.

The OCEANIC-NEGRO FAMILY is dispersed extensively through the Indian Archipelago, and is also found in many islands of the Pacific. M. Bory de St. Vincent describes them in the following terms : "Their physical characters consist in the colour of the skin, which is even blacker than that of the darkest Ethiopians ; the head is rounded yet compressed in front, the facial angle not being more acute than in other Negroes ; the hair is short and woolly and more compact upon the head than in any other people. Their lower extremities are thin, long, and disproportioned, in which respect they resemble the Australians."* The more remarkable communities of this family inhabit Van Diemen's Land and great Andaman Island ; they are of low stature, with high shoulders, prominent abdomens, and large heads, exhibiting, in the language of Colonel Symes, a dreadful mixture of famine and ferocity.†

Mr. Buckingham has lately published a work entitled "America Historical and Statistical," in which he mentions the contempt in which the whites hold the poor unfortunate blacks. "I received," says he, "when lecturing on Palestine, at Chatham-street Chapel, New York, several letters, of which the following will serve as an example :—

" *New York, January 16, 1838.*

" Sir,—In company with several friends I attended
" your first lecture, and though in common with the rest
" of the party I came off highly delighted with the

* Bory L'Homme.

† Embassy to Ava.

“ subject of the evening, I would beg leave, in the spirit
“ of courtesy, and with the most friendly feelings, to point
“ out an evil requiring immediate correction. I allude
“ to the practice of allowing coloured people to mix
“ with the audience, and occupy the ground floor of the
“ chapel. * * * This amalgamation of ‘ black
“ spirits and white,’ you may rest assured, will never be
“ tolerated by a *refined and intelligent community, but*
“ *on the contrary, is considered no less an outrage on*
“ *decency and decorum than an insult to the feelings of*
“ *your audience.*” * * *

But to turn to another anecdote equally illustrative of the feelings of this “ *refined and highly intelligent community.*”

“ During our stay in Washington, Mr. Forrest, the
“ principal American actor, was engaged to perform at
“ the theatre, and several curious circumstances came
“ under my notice. After his representation of Othello,
“ the editor of the ‘ Native American’ denounced the
“ play as ‘ wholly unfit to be permitted in any southern
“ state, where it is revolting, as he thought, to represent
“ the dark Moor Othello, paying his suit to the fair
“ Desdemona.’ ” Thus through the sapience of this
writer, many were deterred from seeing one of the
finest efforts of the genius of our immortal bard, and in
Washington at least, “ Othello” found “ his occupation
gone.”

“ In strict harmony with this sentiment,” continues
Mr. Buckingham, “ was an incident that occurred.
“ Mr. Forrest had performed the part of Sparticus in
“ the play of the Gladiator : and in this is represented,
“ first, the wife and child separated from the husband

“ (all Thracian captives) for the purpose of sale, on which the slaves are excited by Sparticus to revolt, and obtain their liberty.” “ When the play was announced to be repeated for the benefit of Mr. Forrest, the bills were headed, ‘ *On this occasion the coloured people cannot be admitted.*’ This was by the command of the authorities of the place.”

And this too in America, that boasted land of liberty; the daily press of which, by native poets, invokes the blessing of heaven on “ the banner of the free,” and at the same time gives notice “ that *on Monday next will be sold, (either TOGETHER or SEPARATELY,) a Negro and his wife, with or without two healthy children; full PARTICULARS in a future ADVERTISEMENT.*”

From this revolting picture let us turn to the following remarks of Dr. Morton. “ A strong feeling of gratitude is proverbially an Indian trait. General Harrison, who has had ample opportunities to see and know Indians, observes that one of the brightest parts of their character is their high regard for the obligations of friendship. ‘ A pledge of this kind once given by an Indian of any character, becomes the ruling passion of his soul, to which every other is made to yield.’ ”

The intellectual faculties of this great tribe (Indian) are confessedly inferior, but as the human mind expands by culture, time can only prove how near the Indian can approach the Caucasian after the rays of education have been shed upon a family through successive generations. In a note at page 88, Dr. Morton also makes the following observations in defence of the black man, and this part of his work must ever be

regarded as an eloquent and erudite contribution to the natural history of man. He remarks that, "So certain
" is the great antiquity of the Negro race, as to have
" induced more than one philosopher to indulge in the
" conjecture—that this was the primitive stock of man-
" kind, and that all the other varieties were derived
" from it alone, by the action of physical causes.
" According to accredited dates, however, and in the
" words of a distinguished author, it is four thousand
" one hundred and eighty-nine years since Noah and
" his family came out of the ark. They are believed
" to have been of the Caucasian race; and since there
" is no ground for questioning the correctness of this
" belief, let it be assumed as a truth. Now, three thou-
" sand, four hundred and fifty-five years ago, a nation
" of Ethiopians is known to have existed: their skins
" were dark, and they differed widely from Caucasians
" in many other particulars: they migrated from a
" remote country, and took up their residence in the
" neighbourhood of Egypt. Supposing that people to
" have been descendants of Noah, their change must
" have been completed, and a new race formed, in seven
" hundred and thirty-four years, and probably in a
" much shorter period." *According to Dr. Morton's
views, this statement receives additional force from
the recent discoveries in Egypt, inasmuch as they
show beyond all question that the "Caucasian and
" Negro races were as perfectly distinct, in that country,
" upwards of three thousand years ago as they are now."

* Cadwell, Thoughts on the Unity of the Human Species.

Hence, he regards it as evident—"that, if the Caucasian was derived from the Negro, or the Negro from the Caucasian, by the action of external causes, the change must have been effected in, at most, one thousand years: a theory which the subsequent evidence of thirty centuries proves to be a physical impossibility;" and, for this reason, he insists that such a commutation could be produced by nothing short of a miracle.—"Relatively to this question, our anthropological hypothesis involves the three-fold proposition—that Noah and his family were of an antediluvian race superior perhaps to the Caucasian, in organic and mental endowment; that the three primary races originated in the offspring of his sons; and that the foundation of distinct families was then laid, their distinctions being subsequently completed and varied by the action of external, physical, and social causes combined."

With feelings of the greatest satisfaction with his matter and manner, his spirit and principles, as displayed in the introductory essay, I now enter with Dr. Morton on the field of discovery, presented in his *American Cranioscopy*, with its exquisite graphic and luminous illustrations. He commences (let us follow him) with the figures of ancient Peruvian skulls, preceding them with the representation of an embalmed head, disinterred from a cemetery at Arica, and obviously a relic of antiquity. This head "has not all the characters of the ancient Peruvian," nor does Dr. M. introduce it as "an unequivocal example of that race." With evident

accuracy, he describes the forehead as extremely retreating, and partially moulded by artificial means; but the whole cranium is broader, both in its frontal and parietal diameters, than is common in the forementioned people. The sharpness of the superciliary ridges indicates the effects of a broad plate or bandage which has compressed the frontal bone and widened the entire head; it appears to have belonged to a person of distinction.

On the second plate, is figured the skull of a child not more than five years of age. Here all must be struck with the greatly inclined forehead, the extreme elongation of the whole head, and more particularly with the length of the occiput behind the ear; yet there is but little expansion of the head which, with the face, is narrow in proportion throughout. The third figure is that of a skull with a singularly flat and retreating forehead, and projecting face: the head, however, is not remarkable for narrowness; and, if any, a very slight degree of pressure has been applied to the frontal bone. This is the cranium of a woman about thirty years old: her entire desiccated body was obtained from the African district, with the hair very long, and retaining its natural black colour. With her, were found some pieces of an aromatic gum, and a small bag, containing some copper fish-hooks and small instruments of bone which were probably used in forming the meshes of nets or other fabrics. Five of the six skulls, discovered near the lake Titicaca, are strikingly like this female's, both as respects their general form, narrow face, small size, and several dia-

meters; presenting many obvious marks of artificial modification.*

The relic, figured on the fourth plate, furnishes an example of the head of the primitive Peruvians; and therefore, he takes it for a type of the cranial conformation of this race. Though the forehead recedes rapidly, there is but little expansion at the sides; and, from the face to the occiput, there is a narrowness that seems characteristic of this people. Prefixed to the explanatory text, Dr. M. gives reduced outlines of his subjects: in this instance, the posterior view represents the skull elevated in that region without any unnatural width at the sides, and the vertical view sufficiently confirms the fact. This skull was found, about a mile from Arica, in a cemetery of the "ancient Peruvians." The body to which it belonged was found in a sitting posture, with the knees drawn up and the hands placed on the sides of the head; the whole was covered with a coarse fabric marked with stripes of red, which had wonderfully withstood the destroying effects of ages.

On the fifth plate, is figured a cranium strikingly analogous to the three preceding specimens, but the professor had not ascertained in what particular part of Peru the relic was found. The intervention of art, in flattening this skull, is very manifest; yet the alteration has been effected on a forehead extremely low by nature—for the lateral swell is not remarkable; and it is worthy of remark, that the parietal protuberances are not much

* Mr. Pentland's Researches have thrown considerable light on these remains.

more inflated than those of the skull, previously set down as "a type of the cranial conformation of these people." Dr. M. concludes his section, headed "The "Ancient Peruvians," by remarking that the average internal capacity* of the Caucasian or European head is at least ninety cubic inches, and it will be observed, he thinks, that the three adult skulls, in the preceding series of ancient Peruvians, give an aggregate of two hundred and nineteen cubic inches, or a mean of seventy-three only. It will also be observed, he says, that the mean capacity of the anterior chamber is about one half of that of the posterior, or twenty-five to forty-seven; while the mean of the facial angle is but sixty-seven. Hence then, on the evidences afforded by this statement, the result of Dr. M.'s inestimable table of anatomical measurements, and by the universal physiological principle, that *size* of the brain is a chief measure of mental *power* or *energy*, we readily arrive at the induction—that these "Ancient Peruvian" skulls, taken as the type of a family, must have pertained to a nation naturally much inferior in mental power to the

* Dr. Morton gives the precise measurements, both of capacity and size, for each individual subject, throughout his work; and, at page 257, he adds an elaborate and most valuable "Table of Anatomical Measurements," accompanied by another exhibiting their mean results. He is also particularly careful in explaining his mode of taking these measurements," with descriptions of the instruments and processes he employed; they are altogether original and ingenious, and happily calculated to attain the desired end. In the *Medico-Chirurgical Review*, edited by Dr. J. Johnson and James Johnson, Esq., a very correct and elaborate review of this work will be found.

Caucasian and Mongolian races: "in fact the people, " whose skulls included brains of this shape and size, " never could display a high moral and intellectual character: such heads never excelled in the arts nor did " they ever earn the homage intuitively yielded, by civilized minds, to eminence in the sciences."

Before commencing his inquiry into the physical and intellectual character of the Ancient Peruvians, Dr. Morton offers some descriptive and explanatory remarks: from these is extracted a condensed selection. "Peru is a narrow slip of land between the Andes and " the sea, bounded on the south by a desert. It possesses many natural advantages, in its climate, soil, " and situation, and these appear to have been fully " appreciated by its aboriginal occupants; for there is " evidence that several populous nations held successive dominion in the country. Even before the " advent of the Spaniards, history throws much light on " one of these nations—that which was governed by " the Incas. With respect to the others, little else is " known than what can be gleaned from their monuments and cemeteries." Atacama, an arid region dividing Peru from Chili, was the favourite sepulchre of the Peruvian tribes for many ages; for (the doctor observes) "while the climate tends rather to the desiccation than to the decay of the dead, the sand and " salt of the desert have contributed to the same end; " and, in consequence, the lifeless bodies of whole " generations of the former inhabitants of Peru may " now be examined, like those from the Theban catacombs, after the lapse of centuries, perhaps of thousands of years. The great number of desiccated

“bodies remaining in these regions, serve to convey an idea of the vast population that has, at different periods, derived its subsistence from that country.” From an examination of nearly one hundred Peruvian skulls, in his own and other collections, Dr. Morton deduces the result—“that Peru has apparently been peopled, at different periods, by two nations with crania differently formed;” and, he supposes, one of these is extinct, or at least to exist only as blended by adventitious circumstances in various remote and scattered tribes of the present Indian race. That family which preceded the Incas, he designates, the Ancient Peruvian, of which the remains have hitherto been found only in Peru and especially in its Bolivian division. Their tombs abound on the shores and islands of the great Lake Titicaca, in the interalpine valley of the Desaguadera, and in the elevated valleys of the Peruvian Andes. Collao was the name of the country around this inland sea, and Tiaguanaco appears to have been the site of its chief city.

Dr. Morton institutes an inquiry into the physical and intellectual character, the history and tradition of the ancient Peruvians, and he grounds it on what information he could glean from their monuments and cemeteries. However meagre his facts may appear, he thinks they possess considerable interest, and the more so because few others are available. He admits that all his knowledge of their physical appearances is derived solely from their tombs—a necessarily imperfect source of information. “This people,” he says, “appear to have been in no respect remarkable in stature; neither, except in the conformation of the head, did

“ they differ from the cognate nations :” in this, he finds no evidence of mechanical compression, “ but is satisfied “ that it appears to be of the natural form, unaltered “ by art.” “ Altogether, the ancient Peruvian head is “ small, greatly elongated, and narrow in its whole “ length, with a very retreating forehead : but, he states, “ it possesses more symmetry than is usual in skulls of “ the American race. The face projects, the upper jaw “ is thrust forward, and the teeth are inclined outward : “ the orbits of the eyes are large and rounded, the “ nasal bones are salient, the zygomatic arches ex- “ panded, and there is a particular simplicity in the “ sutures that connect the cranial bones.” He next proceeds to combat the very probable supposition, “ that “ a people with heads so small, and so badly formed, “ would occupy the lowest scale of human intelligence.” Such, however, was not the case, for he says, and he proceeds to show, “ that civilization existed in Peru “ anterior to the advent of the Incas, and that those “ anciently civilized people constituted the identical “ nation whose extraordinary skulls are the subject of “ his present inquiry.” Now, since the doctor even appears to feel that, in this instance, his position is wonderful or dubious—made sufficiently so by evidence on most pages and plates in his book, its table of anatomical measurements will be necessary to exhibit the grounds of his opinion under a distinct and conspicuous arrangement.

I. Among the first European travellers in Peru, was Pedro de Cieca, an officer in Pizarro’s army : and, although an unlettered man, he describes with simplicity and clearness whatever came under his

observation. His chronicle* contains the following passage; and it is given entire. "Tiaguanico," says Pedro, "is not a very large town, but it is deserving of notice on account of the great edifices which are still to be seen in it. Near the principal of these, is an artificial hill raised on a ground-work of stone. Beyond this hill, are two stone idols resembling the human figure, and apparently formed by skilful artificers. They are of somewhat gigantic size, and appear clothed in long vestments, differing from those now worn by the natives of those provinces: and their heads are also ornamented. Near these statues, is an edifice which, on account of its antiquity and the absence of letters, leaves us in ignorance of the people who constructed it; and such indeed has been the lapse of time since its erection, that little remains but a well-built wall, which must have been there for ages, for the stones are very much worn and crumbled. In this place also, there are stones so large, and so overgrown that our wonder is excited to comprehend how the power

* Pedro de Cieca: *Chronica del Peru*, cap. cv. ; 8vo. Anvers, 1554. This curious book was translated into English, with the title, *The Seventeen Years Travel of Peter de Cieca, through the mighty kingdom of Peru, and the large provinces of Carthagea and Popayon in South America*; by John Stevens; 4to. London, 1709. There was also an Italian version; 12mo. Venezia, 1560. Dr. Morton likewise refers to Acosta; *Historia de las Indias*, lib. vi. cap. 14. 4to. Sevilla, 1590. Acosta's *Natural History* was translated into French, German, Italian, and English, by Edward Gremestone; 4to. London, 1604.

“ of man could have placed them where we see them.
“ Many of these stones are variously wrought ; and,
“ some having the form of men, must have been their
“ idols. Near the wall, are many caves and excavations
“ under the earth ; but, in another place more to the
“ west, are other and greater monuments, consisting of
“ large gateways and their hinges, platforms and porches,
“ each formed of a single stone. What most surprised me
“ while engaged in examining and recording these things,
“ was that the forementioned gateways were formed on
“ other great masses of stone, some of which were thirty
“ feet long, fifteen wide, and six thick. Nor can I con-
“ ceive with what tools these stones were hewn out ; for it
“ is obvious that, before they were wrought, and brought to
“ perfection, they must have been much larger than we
“ now see them. Before I proceed to a further account
“ of Tiaguanico, I must remark that this monument is the
“ most ancient in Peru ; for it is supposed that some of
“ these structures *were built long before the dominion of*
“ *the Incas*, and I have heard the Indians affirm that
“ these sovereigns constructed their great buildings in
“ Cuzco after the plan of the walls of Tiaguanico ; and,
“ they add, ‘ that the first Incas were accustomed to
“ hold their court in this place.’ Another very curious
“ fact is, that in the greater part of this territory there
“ are no quarries nor rocks whence the materials for
“ these structures could have been derived. In the
“ presence of Juan de Varagas who commands here, we
“ asked if these edifices were built in the time of the
“ Incas ? But they laughed at the question, adding
“ that they did not know who built them, but that they
“ had a tradition of their ancestors, that these struc-

“tures appeared in a single night.” “These statements
 “and many others to the same purpose,” Dr. M. adds,
 “are confirmed by Diego de Alcobaza, the vicar-general,
 “who also visited Tiaguanico and has left an account*
 “of the wonders he saw at that place.

“II. It will be observed by the preceding narration,
 “that tradition among the Peruvians attributed these
 “Cyclopien structures to an era long antecedent to the
 “appearance of the Incas, and this tradition is sus-
 “tained by history; for the city of Tiaguanico did
 “not fall into the hands of the Incas, until the reign of
 “Mayta Yupanque the fourth king, at which period the
 “edifices in question must have been in existence for
 “centuries, and were already in a state of ruin and
 “decay. Garcilaso de la Vega, himself of the royal
 “Peruvian family, admits that these ruins existed at the
 “time the country was conquered by his ancestors;
 “and a Peruvian author, two centuries and a half
 “nearer our own time, states (Mercurio Peruvians,
 “Lima, 1791,) that Tiaguanico is indisputably anterior
 “to the monarchy of the Incas, and speaks, as if from
 “personal observation, of a gigantic pyramid, and
 “colossal human figures cut from solid rock, indicative
 “of the power and genius of a great nation. The first
 “invasion of the Incas was followed by the erection of
 “some temples to enforce the new religion, but their

* Garcilaso de la Vega: *Commentarios Reales, que tratan del origen de los Yncas, reyes que fueron del Peru, de su idolitria, leyes, &c. con la historia general del Peru*; folio, 2 tomes, Lisboa y Cordova, 1609—17.

“ only great architectural monument in these parts, the
“ Temple of the Sun on the island of Titicaca, was not
“ built until the reign of Tapac Yupanque the tenth
“ Inca, early in the fifteenth century. Herrera also
“ alludes to a tradition of the Indians that these edifices
“ have been built by Amazons at a remote era, nor are
“ the Incas mentioned as having any part in their
“ construction. Humboldt says (*Monuments*, I. p. 5),
“ ‘ it is probable that the edifices called in Peru by the
“ name of *Inca-pilca*, or Buildings of the Inca, do not
“ date farther back than the thirteenth century. Those
“ of Vinaque and Tiaguanico were constructed at a
“ more remote period: so also were the walls of un-
“ baked brick, which were made by the ancient in-
“ habitants of Quito. It is to be desired that some
“ intelligent traveller would visit the banks of the great
“ lake Titicaca, the province of Collao, and more
“ especially the elevated plain of Tiaguanico, which is
“ the centre of an ancient civilization in this region.’
“ Dr. M’Culloch (*Researches*, p. 406) remarks, in con-
“ firmation, ‘ that a certain degree of demicivilization
“ prevailed in the nations adjoining the Peruvian em-
“ pire, which was not derived from their communication
“ with the latter.’ ”

III. It will now be asked, in Dr. M.’s words, “ What
“ evidence can be adduced to prove that the people,
“ whose remains we are considering, were the same as
“ those who have left the architectural monuments of
“ Tiaguanico and Titicaca ? ” He regards the fact as
established by the observations of Mr. Pentland,* an

* Report of the Fourth Meeting of the British Association,
p. 624; and Waldie’s *Journal of Belles Lettres*, for 1834.

Englishman who had recently visited the upper Peruvian provinces. He states that in the vicinity of Titi-caca, he had "discovered innumerable tombs, hundreds of which he entered and examined. These monuments are of a grand species of design and architecture, resembling Cyclopean remains, and not unworthy of the arts of ancient Greece or Rome. They therefore betokened a high condition of civilization: but the most extraordinary fact belonging to them is their invariably containing the mortal remains of a race of men, of all ages, from the earliest infancy to maturity and old age, the formation of whose crania seems to prove that they are an extinct race of natives who inhabited upper Peru above a thousand years ago, and differing from any mortals now inhabiting our globe. Specimens of their skulls are now in *London and Paris: they are remarkable for the extreme extent behind the occipital foramen; for two-thirds of the weight of the cerebral mass must have been deposited in this wonderfully elongated posterior chamber: and, as the bones of the face were also much elongated, the general appearance must have been rather that of some monkey family than of human beings. In the tombs, as in Egypt, parcels of grain were left beside the dead; and, it was another singular circumstance, that the maize or Indian corn so left, was different from any that now exists in the country." Mr. Pentland professes his decided opinion, that the extraor-

* Museum of the Royal College of Surgeons.

dinary formed skulls thus brought to light of day, after their long sojourn, could not be produced by pressure or any external force, similar to that still employed by many American tribes; and, in confirmation of this view he adduces the opinions of Cuvier, Gall, and of many other naturalists and anatomists. On these grounds, he is of opinion that they constituted the population of these elevated regions, before the arrival of the present Indian population which, in its physical and moral characters, offers many analogies with the Asiatic population of the old world.

“ IV. The preceding facts appear to establish two important propositions : first, that the primitive Peruvians had attained to a considerable degree of civilization and refinement, so far at least as architecture and sculpture may be adduced in evidence, long before the Incas appeared in their country : and, secondly, that these primitive Peruvians were the same people whose elongated and seemingly brutalized crania now arrest our attention ; and, it remains to inquire whether these are the same people whom the Incas found in possession of Peru, or whether their nation and power were already extinct at that period.” I should rather have preferred the inquiry, whether the people, with elongated and deformed skulls, were the sculptors of stone idols, resembling the human figure, gigantic in size and clothed in long vestments, and of colossal human figures cut from solid rock, and the architects of enormous gateways with their hinges, platforms and porches, of a gigantic pyramid, and of innumerable tombs of a grand species of design and architecture, resembling Cyclopean remains and not unworthy of the ancient Grecian and Roman artists ?

But it is necessary to accompany the professor to the termination of his inquiry.

V. Entering on it he says—"the modern Peruvian empire had existed upwards of four hundred years at the time of the Spanish conquest, so that its origin may be dated somewhere about the year M.C. of our era." "Now it appears (he argues) that among the first military enterprises of this new family, was the conquest of Collao, which possessed a productive soil and a warlike population, and embraced within its confines the Lake Titicaca, from which the Incas pretended to have derived a supernatural origin. Every effort was therefore made to subdue and destroy the Collas. The Inca Yupanque waged against them a war of extermination; and, we are told by Herrera (*Historia de las Indias*, Dec. III. Lib. IX. c. 4.) that 'in some of the towns, he left so few persons alive that inhabitants were afterwards sent from other parts of Peru to colonize the wasted districts: that in order further to depopulate the country, the natives were banished from it in large bodies, and dispersed through other provinces of the empire: and yet such was the dread in which the new dynasty held these warlike people, that they forbade more than a thousand of them to be within the walls of Cuzco at a time, lest they should attempt some revolutionary enterprise. It therefore appears that no means were left untried to subdue and exterminate the people of Callao.' " Yet he remarks, "how far such a system persisted in at intervals for more than two centuries, could have annihilated a whole nation, I shall not attempt to decide."

“ When the Spaniards took possession of these
“ provinces, they found them inhabited by barbarous
“ tribes; and the islands of the Lake Titicaca, which
“ had once been highly cultivated, were then waste and
“ vacant. Upon the lake, were seen rafts made of the
“ reed called by the natives *titora*, and on these rafts
“ whole families made their home, tossed here and
“ there upon the waters by every change of wind.
“ They were in so degraded a state that when asked
“ to what nation they belonged, they replied, ‘ We are
“ not men, but Uros,’ as if they did not consider them-
“ selves as belonging to the human species.” Were
these Uros, the professor inquires, the remains of the
savage colonies sent from other parts of Peru to
supplant the Collas? This inference bears at least
the stamp of probability: but, he admits, it still does
not aid us in ascertaining whether the Collas them-
selves were the remains of the primitive civilized
Peruvians.

VII. Garcilaso describes the Peruvian tribes near
the sea-coasts, to whom he applies the collective name
of Yuncas, as living in the utmost barbarism at the
advent of the Incas. In proof of this statement, he
adduces their mythology, which accorded divine
attributes to every thing in which they observed any
dominant excellence. Thus, says he, they worshipped
the fox for his cunning, the deer for his swiftness, and
the eagle for the perfection of his sight. These
superstitions, however, are not more surprising than
those of the primitive ages of civilization in the Old
World; and there appears throughout the Spanish
historian an evident disposition to depreciate the

character of the ancient tribes, in order to palliate the cruel measures which were resorted to by the Incas for their subjugation. Garcilaso himself describes a remarkable temple at Pachacamac which was erected by the Yuncas; and the Chimuvans, who were something farther to the south, appear to have possessed many of the attributes peculiar to a state of civilization. The inhabitants of Chimu resisted the Incas with great valour, and appear to have been very superior to most of the adjacent tribes at that early period. Nevertheless, they could not compare with the primitive nation of Collao; and, when we find the remains of the latter mingled, as it were, among those of the barbarous hordes on the sea-coast, their presence may be accounted for in the casualties of war or commerce, or by that forced system of colonization which has already been described. "Thus (Dr. M. concludes) have I followed the re-
" searches of Baron Humboldt and Dr. M'Culloch
" with the more zeal, because so little notice has been
" taken of the subject by other writers, and especially
" because we are now able to take one step more in the
" inquiry, by studying the arts of these people in con-
" nexion with their cranial remains."

The learned Reviewer* (before mentioned) has at considerable length, entered into a minute criticism of the pages of this author, and although all his conclusions are not in accordance with my own, I cannot do better than follow somewhat the same line of exami-

* In the Medico-Chirurgical Review.

nation ; selecting here and there such extracts as appear most important. It will be well however to confine ourselves to the examination of facts only, for on the great number recorded, the value of Dr. Morton's work alone depends. The research he has displayed will be more clearly shewn by the following gleanings, so arranged as to form a reference to the work in question, should the reader be induced more attentively to examine the subject. Before doing so it may, however, be necessary to pause for one moment in order to exhibit more fully the wonderful powers of this people (the Inca Peruvians),* whose mouldering remains have been disintombed by Dr. Morton.

Peru, like the co-existent feudal states of Europe, appears to have contained two classes of people wholly unlike each other, viz. the exotic Inca* family, with its numberless ramifications, which held all the honour and advantage in their own hands ; and the native plebeian multitude, who were in as low a state of degradation as the selfish policy of their superiors could devise and establish.

All that was then known of science, art, and refinement, was confined to the former class. The members of the royal family prided themselves on their skill in architecture, astronomy, and the national literature, and it will be observed that whenever an individual was named as pre-eminent in any of these departments of knowledge, he belonged to the dominant caste. In truth the poorer classes were excluded from any parti-

* Incas, Modern Peruvians.

icipation in literature and science, except only when they could be employed as musicians and artisans. Thus the Incas held alike the power and the knowledge in their own hands. "Their principal intellectual attainments were in geometry, music, poetry, and architecture; but a people having no written language, and transmitting only by tradition their attainments in these branches of knowledge, cannot at this late period be fully appreciated, and much less can they be fairly compared with Europeans." (Page 118.)

Architecture is doubtless one of the most early attributes of civilization, and in this the Peruvians had made surprising progress. Their temples, palaces, and tombs, bear ample evidence of this fact, and however simple the design, the execution of it must excite our warmest admiration. Their great object appears to have been to erect *cyclopean* structures, which should at once prove their skill in art and attest their mechanical contrivances. They first separated from the quarries large masses of stone, next shaped them into exact proportions, and then conveyed them to such distances, that we are at a loss to conjecture by what means the object was accomplished. Acosta, whose work (*Hist. de las Indias*) is now before me, after stating that he measured a single block of stone at Tiaguanico, the city of the ancient Peruvians, which was thirty feet long, eighteen feet broad, and six feet thick, declares that there were stones in the walls of the fortress of Cuzco of far greater size, and which were placed there by hand. Yet these masses were not shaped by rule, but of unequal proportion, the irregularities of the one being exactly fitted by extreme toil and ingenuity to

those of the other, without mortar or cement, and yet the place of junction could not be discovered without difficulty. It is equally remarkable that these gigantic fragments of rock were brought from Muyna, which is five miles distant from the city of Cuzco, and some of them even farther than this.*

“ Thus (continues Dr. Morton, page 119) the seemingly superhuman efforts of the Egyptians, are at least equalled by those of the Peruvians, and what most excites our admiration in the one must be conceded to the other. We see the Peruvians, a people destitute of horses, oxen, or any beast of burthen, except the feeble lama; and yet they have left monuments which sufficiently attest their great ingenuity and indomitable perseverance. We are ignorant of the means by which they transported these cyclopean fragments of rock, and the mechanical contrivances that were used in excavating and adapting them to their destined situation. The acts of the present day, with all the refinements of successive generations of ingenious minds, would perhaps be inadequate to achieve those remarkable ends which are common in the mountains of Peru.”

It appears that like the primitive inhabitants of Egypt, the Peruvians knew not the use of iron. This metal, according to the best information we possess on the subject,† was known in the Old World 184 years before the Trojan war, about 1370 years before Christ,

* Garcilaso, Comment. Lib. vii.

† Wilkinson, Ancient Egypt, vol. iii. p. 247.

and there is sufficient proof that the Egyptians used iron instruments and utensils so early as the Pharaonic era.*

* This subject (skill of the ancient Egyptians) suggests a few remarks respecting the *questio vexata* of lost arts. If the Thebans, 1800 B.C. knew less in some departments of useful knowledge than ourselves, they also in others knew more. One great proof of the genius of that splendid line of potentates, entitled the eighteenth Theban dynasty, and the extent of civilization under their rule, was, that the practical, chemical, astronomical, and mechanical knowledge which they shared with the priestly (scientific) colleges, was in some respects equal to, in other even greater than, our own. They made glass in great profusion, (Diodorus Siculus), and burning glasses, and lenses for glasses. They must have cut their delicate cameos by the aid of microscopes. Ptolemy describes an astrolabe; they calculated eclipses; they said that the moon was diversified by sea and land (Plutarch *de facie lunæ*); that "one lunar day was equal to fifteen of the earth;" that "the earth's diameter was a third of the moon's;" and that "the moon's mass was to that of the earth, as one to seventy-two. All these things show good instruments. They made gold potable, an "art lost" till recently recovered by a French chemist. Their workmanship in gold, as recorded by Homer, and their golden clock-work by which thrones moved, must have been exquisitely ingenious. They possessed the art of tempering copper tools, so as to cut the hardest granite with the most minute and brilliant precision. This art we have lost. We see the sculptors in the act of cutting the inscriptions on the granite obelisks and tablets. We see a pictorial copy of the chisels and tools with which the operation was performed. We see the tools themselves. But our tools would not cut such stone with the precision of outline which the inscriptions retain to the present day. Again, what mechanical means had they to raise and fix the enormous imposts on the lintels of their temples at

“Such of the implements of the Peruvians (says Dr. M.) as in other countries are made of that metal, were composed of copper alloyed with a very small

Karnac? Architects now confess that they could not raise them by the usual mechanical powers. Those means must, therefore, be put to the account of the “lost arts.” That they were familiar with the principle of Artesian wells has been lately proved by engineering investigations carried on while boring for water in the Great Oasis. That they were acquainted with the principle of the railroad is obvious; that is to say, they had artificial causeways, levelled, direct, and grooved (the grooves being anointed with oil) for the conveyance from great distances of enormous blocks of stone, entire stone temples, and colossal statues half the height of the monument. Remnants of iron, it is said, have lately been found in these grooves. Finally, M. Arago has argued, that they not only possessed a knowledge of steam power, which they employed in the cavern mysteries of their pagan freemasonry (the oldest in the world, of which the pyramids were the lodges), but that the modern steam engine is derived, through Solomon de Caus, the predecessor of Worcester, from the invention of Hero, the Egyptian engineer. The contest of the Egyptian *sophos* with Moses before Pharoah pays singular tribute to their union of “knowledge and power.” No supernatural aid is intimated. Three of the miracles of their natural magic (see Sir D. Brewster) the jugglers of the east can, and do now perform. In the fourth, an attempt to produce the lowest form of life, they fail. From the whole statement one inference is safe, that the daring ambition of the priestly chemists and anatomists had been led from the triumphs of embalming and chicken hatching (imitating and assisting the production of life) to a Frankenstein experiment on the vital fluid and on the principle of life itself, perhaps to experiments like those correctly or incorrectly ascribed to Mr. Crosse, in the hope of creating, not reviving, the lowest form of animal existence.

“ proportion of tin, which gave it great additional
“ tenacity. It was with chisels of this kind that they
“ shaped those enormous blocks of stone which have
“ already been mentioned. Yet all we have said,
“ observes Ulloa, ‘is surpassed by the ingenuity with
“ which they wrought emeralds; these gems being
“ found cut into various shapes, some spherical, others
“ cylindrical, conical, and various other shapes, made
“ with perfect accuracy, and drilled through with all
“ the delicacy of our European artists. It is an in-
“ surmountable difficulty to explain how they could
“ work a stone of such hardness.’ ”*

The formation of public roads must ever be regarded as a proof of civilization, and in the construction of their roads the talent of the Incas was very conspicuous. One of these described by Humboldt in his journey over the plains of Assuay is eminently deserving of notice. “ We were surprised to find in this place, and
“ at heights which greatly surpass the top of the peak
“ Teneriffe, the magnificent remains of a road con-
“ structed by the Incas of Peru. The causeway, lined
“ with freestone, may be compared to the finest Roman
“ road I have seen in France, Spain, or Italy. It is
“ perfectly straight and keeps the same direction for
“ six or eight thousand metres. We observed the
“ continuation of this road near Caxamarca, one
“ hundred and twenty leagues to the south of Assuay:
“ and it is supposed in the country that it led as far as
“ the city of Cuzco.”†

* Ulloa is quoted in M'Culloch's Researches, p. 336.

† Monuments, I. p. 241.

After a careful review of the preceding facts (argues the author of *Crania Americana*), how idle the assertion of Dr. Robertson,* that America contained no monuments older than the conquest! how replete with ignorance are the aspersions of Pinkerton† and De Pauw,‡ who appear to have veiled truth in order to support an hypothesis. "It is in vain longer to contend against facts; for however difficult it may be to explain them, they are nevertheless incontrovertible. *Whence the Peruvians derived their civilization may long remain a mooted question, that they possessed it cannot be denied.*" "At a time when a public highway was either a relic of Roman greatness or a nonentity in England, there were roads fifteen hundred miles in length in the empire of Peru. The feudal system was as firmly established in these transatlantic kingdoms as in France. The Peruvians were ignorant of the art of turning an arch, but they had constructed suspension bridges over frightful ravines: they had no implements of iron, but their forefathers could move blocks of stone as huge as the Sphinxes and Memmons of Egypt.‡§

In the science of astronomy the Peruvians appear to have been behind the Mexicans. They made constant observations on the sun's rising and setting, and also upon the shadows cast by pillars at the time of the

* Robertson, *Hist. Amer.*

† Pinkerton, *Essay on the Goths.*

‡ De Pauw, quoted by Pinkerton.

§ Long, *Polynesian Nation.*

esq. INOXES. Their year, says Herrera, was divided into twelve months, distinguished by their several names; particular festivals were appointed to each of them. The year began in January, till one of the Incas ordered it should begin in December, at which time they celebrated their great festival. The Peruvians were also ignorant of the causes of eclipses, supposing the planets at that period to be sick. They particularly distinguished the planet Venus, some of the brightest fixed stars, the Pleiades, the Milky Way, &c., to all of which they gave certain names, and imagined them for the most part to be, or to represent, various animals which they were accustomed to meet with.*

At page 122, Dr. M. proceeds to analyse the government, social condition, and religion of the Incas. He writes—"The monarchy appears to have had its due portion of insurrections and disturbances of various kinds, some of which reached the palace itself; one Inca at least was deposed and put to death. These facts sufficiently show that the civilization and comparative refinement of the Incas were blended with some remains of the ferocity of the savage.†

"In their social relations they appear to have been characterized by gentleness and affection; and although by a remarkable law all crimes were alike punished with death, such was the natural docility of

* M'Culloch's Researches.

† Garcilaso, Carli Let. Amer. Stephenson, S. Amer. Frycaut, Travels, and other writers, confirm the above statements of Dr. Morton.

“ the Peruvians that executions are said to have been
 “ unfrequent among them.

“ *Matrimonial engagements* were entered into with
 “ very little ceremony or forethought, and they were
 “ readily set aside at the option of the parties. Poly-
 “ gamy was lawful but uncommon; among the common
 “ people incontinence among unmarried people was
 “ scarcely regarded as a crime, and sensuality in some
 “ degree countenanced by royal authority, was a pre-
 “ vailing vice. As a natural consequence, child murder
 “ became so common that foundling hospitals were
 “ established at the public expense, by an order of the
 “ government. In truth the morals of the Peruvians
 “ in these respects had nothing to recommend them.*”

Their diet for the most part was vegetable, maize entering largely into their aliments. Exhilarating drinks were in common use among the men; the principal preparation of this kind was called chicha, which was fermented from the maize. So fond were the natives of this beverage, that it was even placed near the dead in their graves; and we have the authority of Ulloa for saying that in the present day the use of spirituous liquors destroy more Peruvians in one year than the mines do in fifty.

The other peculiarities of this people are thus minutely described in the *Crania Americana*.

“ The great mass of people was indolent from two
 “ causes, the enervating warmth of the climate, and
 “ the humiliating nature of their political institutions,
 “ of which we have already spoken.

* M'Culloch gives a similar account.

“ The apathy of the common people rendered them
“ filthy and negligent in their persons, and in my
“ examinations of several mummies of this class, taken
“ from the old cemeteries near the coast, I have
“ noticed the hair in many instances to be charged with
“ desiccated vermin, which, though buried for cen-
“ turies in the sand could not possibly be mistaken for
“ any thing else.

“ The *religious system* of the Peruvians was marked
“ by great simplicity, and was divested, as we have
“ observed, of those bloody rites which were common
“ with the Aztecs of Mexico. They believed in one
“ God, whom they called Varacocha; in the immor-
“ tality of the soul; and in rewards and punishments
“ in the next life. They worshipped both the sun and
“ moon, in whose honour they erected temples and
“ formed idols. Even the stars received their share of
“ homage, because, as it has been happily expressed,
“ they were the handmaids of the greater luminaries.
“ To these they sacrificed both beasts and birds, but
“ never human beings.*

“ But one of the most remarkable features of the
“ Peruvian religion was, the consecration of virgins, in
“ the same manner as practised in modern convents.
“ Each temple was provided with a body of these

* Acosta charges the Peruvians with sacrificing their own children, which is denied by Garcilaso, and there is in fact no proof of this. On the contrary, the Inca Roca, having conquered the ferocious tribe called Canches, forbade them, under pain of death, to sacrifice their children. This is stated by Carli, in his *Lettres Americaines*, p. 115.

“recluses dedicated to the sun, whose office was not to assist in religious exercises, but to weave certain fabrics for the use of the royal family. The Peruvians, moreover, enjoined vocal confession on all the classes, and there were specified penalties for all crimes. To conceal any thing in these confessions was in itself deemed criminal.

“The superstitious and barbarous funeral rites of these people were very remarkable. When their chief men died, they mourned them many days, and buried them with great solemnity. In the grave or tomb they deposited the most valuable possessions of the deceased, his weapons, utensils, meats, and drinks; and also a number of human victims, women, boys, and servants, to attend on the departed in the next world. Besides these sacrifices which custom rendered compulsory on certain individuals, others committed suicide for the same purpose, and thus when Huayna Capac died early in the fifteenth century, no less than four hundred persons expired by their own hands, in the ambitious delusion of accompanying their dead monarch to his new existence.”*

These extracts are sufficient to prove the care and attention of Dr. Morton in collecting important facts, tending to exhibit the characteristics of this extraordinary people. The Peruvians were as shrewd and

* It is curious to observe, how much the customs and religious rites of the ancient Egyptians resemble those of the Inca Peruvians; this resemblance strikes us with additional force in the instance of “burying the dead.”

politic as the other Americans, and constant victories over neighbouring nations gave them both confidence and supremacy. When, however, they were opposed to a people better armed, though infinitely inferior in number to themselves, their courage deserted them, and the imagination rests with wonder on the spectacle of a powerful empire destroyed by a band of brigands. It is granted that the robbers were better armed, defended by armour, and mounted in part on horses ; still, it seems incredible that the Peruvians should so quickly have yielded when it is remembered that they could, after the first shock of Pizarro's treachery, have opposed one thousand natives to one invader. The invading force consisted of sixty-two horsemen, and one hundred and two foot soldiers, of whom twenty were armed with cross-bows and three with muskets.

Although the Peruvians yielded to this contemptible force, some redeeming circumstances mark this seeming pusillanimity. The Spaniards had taken their king, and held him as a prisoner, regarding him as a hostage for the good conduct of his subjects ; and when the news arrived of the successes of their countrymen, the Spaniards flocked to Peru in such overpowering numbers, that the disparity in force each day became less. At length goaded to resistance by the cruelty of their oppressors, they fought with a desperation and courage well worthy men fighting for their father land, their wives, their children, and their temples. But the reaction came too late ; the sun of their former glory had for ever departed, and in the year 1533 the empire of Peru ceased by the murder of Atahualpa. The

conquerors, however, almost all perished, from Pizarro, who was butchered by his own countrymen, to the infamous Valverde, sacrificed by the Indians.

In a former part of this volume I have spoken of the five races of men, adopting the arrangement of Professor Blumenbach, which Dr. Morton considers the most complete of any yet given. Each race, however, admits of division into the following families:—

I. CAUCASIAN RACE.

1. THE CAUCASIAN FAMILY.
2. THE GERMANIC FAMILY.
3. THE CELTIC FAMILY.
4. THE ARABIAN FAMILY.
5. THE LIBYAN FAMILY.
6. THE NILOTIC FAMILY.
7. THE INDOSTANIC FAMILY.

II. THE MONGOLIAN RACE.

8. THE MONGOL-TARTAR FAMILY.
9. THE TURKISH FAMILY.
10. THE CHINESE FAMILY.
11. THE INDO-CHINESE FAMILY.
12. THE POLAR FAMILY.

III. THE MALAY RACE.

13. THE MALAY FAMILY.
14. THE POLYNESIAN FAMILY.

IV. THE AMERICAN RACE.

15. THE AMERICAN FAMILY.

16. THE TOLTECAN FAMILY.

V. THE ETHIOPIAN RACE.

17. THE NEGRO FAMILY.

18. THE CAFFRARIAN FAMILY.

19. THE HOTTENTOT FAMILY.

20. THE OCEANIC-NEGRO FAMILY.

21. THE AUSTRALIAN FAMILY.

22. THE ALFORIAN FAMILY.

An epitomised description of some of these families, the groundwork of which is taken from the *Crania Americana* of Dr. Morton may be both useful and interesting.

CAUCASIAN FAMILY.

Koordistan* is inhabited by two sorts of people, the clansmen, or tribesmen, a military order, and the peasants or cultivators of the soil, and the difference in physiognomy between them is so easily distinguishable that it would be impossible for one of the latter to assume the bearing of the higher caste. The peasant has a much softer and more regular countenance, sometimes showing the Grecian fea-

* Koordistan is placed to the east of the Tigris.

tures; the tribesman is hard-featured, with a thick prominent forehead, abrupt lines, and grey or blue eyes, usually fixed in a kind of stare: he holds the former in a state of absolute bondage. The Koords treat their women more kindly than the Turks or Persians, and have a better idea of domestic comfort: yet they are haughty and cruel, fond of war and pillage, and fight among themselves when they have no common enemy.

The unmixed Greeks are above the middle stature, having fine proportions and a graceful mien: the forehead is high, expanded, and but little arched, so that it forms, with the straight and pointed nose, a nearly rectilinear outline: the face is a beautiful oval, and small in proportion to the voluminous head. The Roumelian population of Greece most resembles her ancient inhabitants in moral traits: they are hardy, brave, and warlike, and have never been completely subjected by the Turkish aggressors. The voluminous head, and lofty forehead co-exist universally with supreme intelligence; and, in the displays of this, the ancient Greeks have never yet been equalled.

The Roman head differs essentially from the Greek, in having the forehead lower and more arched, the nose strongly aquiline, with the nasal bones much depressed between the eyes. In the ancient busts, and statues, we discern the genuine type of the Roman countenance, consisting of a large flat head, a low wide forehead, a face broad, and square, with a short thick neck, and stout broad figure. Every page of the Roman history confirms the observation—that, asso-

ciated with the large flat head, and its low wide forehead, the character of persons, and nations is distinguished by energetic manifestations of selfishness, pride, cruelty, and stern perseverance.

GERMANIC FAMILY.

The Germans are well known for their middling stature, robust form, light hair, and fair florid complexion. In them, the head is large and spheroidal, the forehead broad and arched, the face round, the eyes blue, and the neck rather short. Their moral character is marked by decided personal courage, great endurance of fatigue, firmness and perseverance, with a strong attachment to their families and their native land. Intellectually, they are conspicuous for industry and success in the acquisition of knowledge. With a singular blending of taciturnity and enthusiasm, they rival all modern nations in music, poetry, and the drama: nor are they less eminent for their critical attainments in language, and the exact sciences.

CELTIC FAMILY.

The Celtic people have strongly marked features. They are tall, athletic, little prone to obesity, and their physical strength corresponds to their muscular proportions. They have the head rather elongated, the forehead narrow and but slightly arched; their brow is low, straight, and bushy; the eyes and hair are light, the nose and mouth large, the cheek-bones

high, the face angular, and the expression harsh. They are slow, but laborious, and endure fatigue beyond the sufferance of other men; in disposition, they are frank, generous, and grateful, yet quick-tempered, pugnacious, and brave to a proverb. We have the following most faithful graphic statement from the pen of M. Bory de St. Vincent, a very clever French philosopher. "The Celts and Gauls have become the modern French, of whom the Franks of the middle ages are not the parent stock, as those assert who trace their genealogy to the latter barbarians. It is from their Celtic ancestors that the French derive their vivacity, their inconstancy, their impetuous courage devoid of perseverance, a vanity often puerile, and a remarkable quickness of perception, together with that levity which is the jest of a neighbouring nation."

ARABIAN FAMILY.

In the Arabian family, the face represents an elongated oval, with a delicately pointed chin and a high forehead; the eyes are large, dark, and full of vivacity, the eye-brows finely arched, the nose narrow and gently aquiline, the lips thin and the mouth expressive. Some very opposite elements are blended in the moral character of the Arabs; they are the children of impulse; at one moment destroying or plundering the unresisting traveller, and the next receiving with open hospitality the stranger, whose necessities have driven him to their tents. Except in their wars and pastimes, they are indolent; vanity is

the characteristic of all classes; their covetousness and duplicity are remarkable; their politeness is extreme; their sobriety constitutes a national feature."

Originally, the Hebrews or Jews were a pastoral people; but, in after times, they occupied the cities and territory of Palestine, under a changeful sort of government of judges and kings. Since the extinction of their nation by the remorseless Romans, they have been ill-used outcasts in every land. Their physiognomy is familiar in the receding forehead, the elongated face, the large and aquiline nose. "In its general bearing, the Hebrew head very faithfully indicates the mental proclivity of this most singular race. Whatever merits attach to their name for the display of high intelligence, these are due to individuals inspired with extraordinary energy in the exercise of extraordinary missions; but their devoted attachment to their religion and their patient endurance of adversity, are among the most striking traits of their character."

NILOTIC FAMILY.*

On the ruins of their ancient monuments, and their mummies, we retrace the physical lineaments of the primitive Egyptians; and these remains commemorate two prominent varieties of this extraordinary family. There is a remarkable resemblance among the innu-

* The valley of the Nile is a narrow strip of land, a hundred miles long and only ten broad.

merable heads sculptured in the temples of the Nile; and one who is accustomed to examine them, becomes so familiar with the Egyptian physiognomy that when other races are introduced, as the Jews or Negroes, the eye can detect them without difficulty. There is also a singular accordance in conformation between the sculptured heads and the real ones taken from the Theban catacombs. One of the varieties is known by lowness and narrowness of the forehead: the other presents the full developement of the Caucasian head: the former greatly predominates in the sculptures, and has been regarded conjecturally, as characteristic of the Egyptian race. The nose was rather long, and joined the head much in the Grecian manner: the eye was elongated and rather oblique, the lips well formed, the chin rounded and moderately full, and the whole expression of countenance mild and pleasing; the hair was long, straight, and generally black; and the person appears to have been spare, with long limbs, and delicate hands and feet. The antiquity of the Egyptian nation, and their skill in the arts and sciences, have been proverbial in all ages; and it is a remarkable fact that the first glimpse we obtain of the Egyptian history and manners, shows a people already advanced in the arts of civilized life: the same customs and inventions that prevailed after the accession of their eighteenth dynasty, are found to have been established in the remote age of Osirtasen the contemporary of Joseph. Their antiquity and learning are illustrated by the facts—they completed the pyramids of Memphis within a few hundred years after the era assigned to the

Noachian deluge; they wrote their hieroglyphic characters on papyrus, as early as the time of Cheops, two thousand years before Christ; they discovered, and constructed the arch more than three thousand years ago: the Greek scroll is common in the tombs of the Pharaohs: and the so-called Doric column and entablature ornamented the porticoes of Beni-Hassan, before sculpture was an art in Greece: hence it is evident, that this singular family had attained a high degree of civilization and refinement at a time when the western world was still involved in barbarism, when the history of Europe had not yet begun, and long before Athens, Carthage and Rome were in existence. Physiological research will, one day, and that not a distant one, succeed in discovering facts sufficient to establish the conclusion that the "learning of the Egyptians" was begun, continued, and consummated by a race possessing the "full development of the Caucasian head."

INDOSTANIC FAMILY.

Among the Hindoos in general, the face is oval, the nose slightly aquiline, the mouth small, the teeth vertical and well-formed, the chin rounded and generally dimpled; the eyes are black, bright and expressive, the eye-lashes long, the brow thin and arched; the hair is long, black and glossy, the beard very thin. The Hindoo head is small and narrow, especially across the forehead which is only moderately elevated. By nature, the Hindoos appear to be a mild, sober and industrious race, warm in their

attachments, and fond of their children; but their love of the marvellous, fostered as it is by a fantastic religion, is almost without a parallel among nations. They are of a timid disposition, and not inclined to cruelty; yet their avarice, which is extreme, leads them readily to commit murder for the most trifling acquisition. They practise deception with infinite art, to which falsehood and perjury form no obstacles. Their intellectual character is distinguished among the present Asiatic nations; but their learning has been very much devoted to comments on their sacred books, which are extremely numerous. They have had many admirable writers in poetry and the drama: they excel in some branches of mathematics, and especially in algebra: their antique architectural remains are of a stupendous kind, and consist chiefly of rock-hewn temples, ornamented with elaborate sculpture. According to Bishop Heber's observations, the criminal calendar of India is generally full of gang-robberies, incendiarism, and analogous crimes, perpetrated by native Hindoos, notwithstanding the apparent mildness of their manners; and the number of children who are decoyed aside, and murdered for the sake of their ornaments is dreadful. For all these horrors, the national system of religion is mainly answerable, inasmuch as, whatever moral lessons their sacred books contain—and they are very few—are shut up from the mass of the people, while the direct tendency of their institutions is to evil. As a nation, the people are sober, industrious, affectionate to their relatives, faithful to their masters, easily attached by kindness and confidence; and, in

ease of the military oath, they are of admirable obedience, courage, and fidelity, in life and death. But their morality does not extend beyond the reach of positive obligations; and, where these do not exist, the Hindoos are oppressive, cruel, treacherous, and every thing that is bad. Thus, in a most remarkable manner, the Bishop's dismally instructive observations corroborate those of Dr. Murray Pater-son, published more than sixteen years ago in the Phrenological transactions, and afterwards introduced into Vol. II. of the Phrenological Journal, in an admirable article entitled an Essay on the coincidence between the natural talents and dispositions of Nations, and the developement of their brains.

TURKISH FAMILY.

The modern Turks are of a middling stature, with an athletic form and well-proportioned limbs. Their head is round, their eyes dark and animated, and the whole face expressive and intelligent. In manner, they are proverbially courteous; but their true character is marked by violence of passion, cruelty and vindictiveness. They are intelligent and ready in the acquisition of every kind of knowledge, and they would soon assume an elevated rank in literature, were it not for the trammels of superstition and fatalism.

CHINESE FAMILY.

The Chinese are rather below the middle stature, stout-limbed and inclined to flesh. Their head is large,

rounded and somewhat conical, owing to a high re-treating forehead. From inspection of specimens, the Chinese skull appears to be oblong-oval, in its general form: the frontal bone is narrow in proportion to the width of the face, and the vertex is prominent: the occiput is somewhat flattened: the orbits are of moderate dimensions and rounded. The Chinese eye is small, half closed, and drawn obliquely upwards towards the temple; the upper eyelid projects a little beyond the lower; the eyebrows are black, highly arched and linear: the nose is small, flattened towards the nostrils, broad at its root, and separated from the forehead by a strongly marked depression. Contemplated in their moral character, the Chinese are distinguished among themselves by mildness and urbanity; by a wish to show that their conduct is reasonable, and generally a willingness to yield to what appears so; by docility, industry, subordination of the young, respect for the aged and for parents; and by their acknowledging the claims of poor kindred. These, however, are virtues of public opinion; and, of course, they have more show than reality, in particular cases; for, on the other hand, the Chinese are specious, but insincere, jealous, envious, and distrustful to a degree. Conscience for them has few checks but the laws of the land, and a little frigid ratiocination on the fitness of things which is generally ineffectual to restrain, when the selfish and vicious propensities of our nature may be indulged with impunity. The Chinese are selfish, cold-blooded, and inhumane:* in the punishment of criminals, by

* Davies's Description of the Empire of China.

the practice of torture they are barbarously cruel: those in authority entirely disregard human suffering and human life, when the infliction of the one or the destruction of the other can be made subservient to the acquisition of wealth or power. Although, in letters, in science, and in art, the Chinese remain the same now, that they were many centuries ago, yet their intellectual character is deserving of especial attention. That nation cannot be viewed with indifference which possessed an organized government, an army, a written language, historians and philosophers, coeval with the inspired historian of the creation. They have their national music and their national poetry; but, of sculpture, painting, and architecture, they have no just conceptions; and their national pride prevents their adopting the arts of other countries. Their faculty of imitation is extraordinary, and their mechanical ingenuity is universally known to be pre-eminent. They possess a copious literature, both ancient and modern; they have known, and practised the art of printing, for eight hundred years; and their written language, with the same characters hitherto used, is of an extreme antiquity. Vessels of Chinese porcelain, not less than four thousand years old, have been discovered in the Egyptian catacombs, with inscriptions easily read by the scholar versant in Chinese philology. On three of these vessels is inscribed the proverb—*THE FLOWER OPENS, AND LO! ANOTHER YEAR.** The Japanese bear a striking resemblance to the people of China, with the

* Outlines of Universal History.

same features in an exaggerated degree. They are short, with heavy limbs, large heads and sunken eyes; and, like their "continental neighbours," they are laborious artificers, less ingenious, and equally superstitious. For the psychological naturalist, it might be a legitimate and favourite inquiry—to determine demonstrably the constitution of mind, and the co-existing configuration of head possessed by the people, who devised, enacted, and have perpetuated those social institutions, which caused, and continue the apoplexy of progressive civilization among so many of the oriental nations.

INDO-CHINESE FAMILY.

The Aracanese, a barbarous people and very uncultivated, are accustomed to flatten the heads of their children by means of a piece of lead, applied soon after birth; they slit and distend their ears to a frightful degree: and they are represented as being the most uncultivated and barbarous people of the Indo-Chinese family. By this singular process of artificially flattening the forehead of infants, the head is deformed, and parts of the brain forcibly driven from their natural positions and relations; thus by a necessary consequence, the head being disfigured, ceases entirely to be a natural subject of observation.

In the Siamese, the forehead at its superior part is narrow; between the cheekbones, the face is broad; the chin is pointed, so that the whole contour seems rather lozenge-shaped, than oval. The occipital portion of the head is nearly vertical; and compared with the

anterior, and other divisions, it is very small. The lateral halves of the head are not symmetrical: from the ear upwards, it rises to a great height, the posterior part of the coronal region being very prominent. Altogether, the Siamese head is peculiar: its diameter, from the front backwards, is uncommonly short, and hence the general form is somewhat cylindrical: in most instances, the occipital foramen is placed so far back that, from the crown to the nape of the neck, the line is nearly straight. Notwithstanding the Siamese are said to be remarkable for filial respect, and regard for their rulers, yet the national moral character appears to be at a very low ebb. They are described as suspicious, vacillating, and cruel; servile and cringing to their superiors, in the extreme; arrogant and tyrannical to those who are below them in rank. Their virtues and their vices are venal: the services of the judge, and the assassin have each their price: sordid oppression, and priestcraft, allied with wretchedness, and filth, every where abound. An intelligent traveller regrets his not having met with one honest man in their land.

We next come to the inhabitants of Cochin-China. The form of the face is round, so that the two diameters are nearly equal: the forehead is short and broad: the occipital portion of the head is elongated: they are a coarse featured people, and render themselves repulsive by the constant use of areca and betel, which redden the lips and blacken the teeth. They are the gayest of the oriental nations; good-natured and polite, but extravagantly fond of etiquette. So versatile are their feelings and actions, that they have been compared to

the monkey race, whose attention is perpetually changing. They are active and warlike, but want industry and perseverance.

POLAR FAMILY.

In the Nicobar Islands, the natives are said to compress the heads of newly born infants, in such a manner as to flatten the occiput, and cause the teeth to project outwards. Their colour is a deep copper: they have thick lips and wide mouths. They live in a very uncivilized state, and compel their women to cultivate the ground; hitherto, they have resisted all measures for the improvement of their condition. They appear of Indo-Chinese extraction.

The Samoyedes are seldom more than five feet high: they seem "all of a heap," have short legs, small neck, and a large head, with the nose and face flat, and the chin projecting. They are an indolent and a savage people, extremely apathetic on all those subjects that excite the feelings of other men: their women often become mothers at twelve years of age. They call themselves Chosova.

MALAY FAMILY.

The nose is short, depressed, and flattened; the eye small, black, oblique, and expressive; the face broad, compressed, and very prominent. The Malayan has a large head, with a low forehead, moderately full and arched, while the occiput is much compressed, and

often projecting at its upper and lateral parts. The Malays possess an active and enterprising spirit; in temper, they are ferocious and vindictive: caprice and treachery are among their characteristic vices: and their habitual piracies are often conducted under the mask of peace and friendship. They stain their teeth with the betel root.

POLYNESIAN FAMILY.

With the Polynesian* islanders the stature is middling and athletic; the forehead low, but not receding; the eyes black, bright, and expressive; the nose well formed. Between the aristocratic and plebeian classes, however, there exists a great disparity as respects stature, features, and complexion. The privileged order is much fairer and taller than the other: their heads are better developed, and their profile shows more regular features, including the arched and aquiline nose. The indolent habits of this caste dispose it to obesity which often becomes extreme after middle life. The Polynesians are intelligent, imitative, and docile; their progress in elementary literature, and the more useful arts has been rapid; and perhaps no people on the globe have ever been more amenable to the usages

* This name is given to all the islands in the Pacific Ocean, from the Ladrões to Easter Island, including the Carolinas, Sandwich, Friendly, Society, Navigators', Harvey's, and the Marquesas islands.

of civilized life, and the doctrines of Christianity. Their intellectual capacities have been considered equal to those of the Caucasian race: this much however is true of them—that, although they rapidly acquire ideas by means of their active perceptive powers, yet their reflective faculties have not hitherto expanded in proportion. In their uncivilized state, the Polynesians are singularly devoted to boxing, archery, and boat-racing; but their most striking predilection is for maritime amusements and adventure. Their canoes are large, and constructed with great ingenuity: in these vessels they prosecute their wars, and undertake considerable voyages for profit or pleasure. The fondness of this people for the sea, constitutes a national and predominating feature in their character: and, in their naval architecture, a high degree of ingenuity is conspicuous.

AMERICAN FAMILY.

Of the great American family, four branches are described:—

1. THE APPALACHIAN BRANCH.

This includes all the nations of North America excepting the Mexicans, together with the tribes north of the river of Amazons, and east of the Andes.

2. THE BRAZILIAN BRANCH.

This is spread over a great portion of South America, more particularly that part, embraced between the rivers

Amazon and La Plata. The physical traits of these people differ little from the above branch; they possess perhaps a larger, and more expanded nose, and larger mouths and lips. The eyes are small, and more oblique, and set far apart.

THE PATAGONIAN BRANCH.

This group includes the nations south of the La Plata to the Straits of Magellan, and the mountain tribes of Chili. They are for the most part distinguished for their fine forms, and indomitable courage.

4. THE FUEGIAN BRANCH.

Those people who inhabit the island of Terra del Fuego are sometimes called Patagonians. Dr. Morton thinks the term objectionable, and therefore has applied this more local designation. He remarks that—

“The Appalachian head is rounded; the nose large, salient, and aquiline; the whole face triangular; the chest broad; the body and limbs, muscular. The nations composing this great branch of the American family are warlike, cruel, and unforgiving: they turn with aversion from the restraints of civilized life, and have made little progress in mental culture or the useful arts.” The co-existence and co-efficiency of the round head, with “a ruthless disposition, may be contemplated, and ascertained in the feline tribe, from the lion or tiger, down to the domestic cat; and the study will be facilitated by instituting observations on the

head or skull, of a parlour cat, placed side by side with that of a hare or rabbit; for the purposes of comparison."

The physical aspect of the Fuegians is altogether repulsive, and their domestic usages are said to heighten the defects of nature. These islanders are of low stature: have large heads, broad faces, and small eyes, capacious chests, and clumsy bodies, with great knees and ill-shaped legs. Their expression of countenance is vacant: they seem destitute of the usual curiosity of savages, caring little for any thing that does not minister to their present wants. Dr. Morton attributes the difference between the Fuegians and other American nations to the effects of climate and locality, and the consequent habits of life, tending to depress and brutalize the mind, and to impair the physical man. "This excessive degradation in the Fuegian character, proceeds from the preponderance of animality in the constitution of their mind, and the structure of their head, combined with a weight of the phlegmatic temperament. With a large head, having a lofty broad forehead, and high intelligence its inseparable, associate, the dwellers in the dreary island of Terra del Fuego will soon extricate themselves from the ungenial effects of its climate and locality."*

* Such is the opinion of Dr. Morton. I confess my inability to discover how a high forehead can altogether protect the inhabitants of this island, from the effects of "its climate and locality."

THE CAFFRO-AFRICAN FAMILY.

The Caffers are tall, athletic, and well-proportioned, with much natural grace of manner. Their head is large, with the forehead full and vaulted, the nose salient and aquiline, and the face a fair oval. Their physiognomy, is remarkable in being a combination of the European and Negro features. This people is as much above the genuine Negro in morals, and intelligence, as in physical appearance. The tribes resident near the English colony are less cruel and superstitious than some others; but their appeals to pretended sorcery in punishing crimes, and in settling disputes, and the despotic sway of their chiefs, are taken for evidences of a great degree of barbarism.

One of the most singular varieties of the human family is that of the Hottentots; their stature is of the large class; their persons are middle and clumsy, with fine limbs, and remarkably small hands and feet. Their head is large, the forehead low and broad, the face extremely wide between the cheek-bones, whence it retreats rapidly into a contracted chin. "The Hottentots have but very vague ideas of religious obligations, although they are prodigiously superstitious." They are inveterately indolent and gluttonous, devouring every kind of animal garbage that falls in their way, without preparation; and, when thus gorged, they throw themselves down, and sleep off the effects. They are susceptible of some improvement however, and have been converted into tolerably efficient soldiers;

hence, in the large head with its low forehead, the main traits of their character are not unfaithfully indicated.

OCEANIC-NEGRO FAMILY.*

Throughout the Indian Archipelago and in many islands of the Pacific Ocean, the various tribes, collectively denominated Papuas, are extensively dispersed. They are easily recognised as members of the great Negro race, by their similarity of organic features and mental capacities. In them, the head is rounded, yet compressed in front and at the sides, with the forehead greatly depressed: their manners are savage, and they exhibit little aptitude for moral and intellectual improvement.†

AUSTRALIAN FAMILY.

The New Hollanders are of full stature, with ample chests and thin bodies, with long slender limbs. Their face is frightfully ugly: it projects greatly from the head: the mouth is particularly prominent owing to its width and the great size of the lips: the nose is flat and broad, with the nostrils expanded: it is separated from the forehead by a deep sinus. The frontal

* Papuas, called also Melaniens, or Oceanic Negroes.

† The Papua skulls figured in Freycinct's Voyage have the broad face of the Malay; the whole head being somewhat rounded.

ridges often overhang the eyes, while the forehead is low and slopes rapidly to the top of the head. They have fierce and vindictive tempers, and are passionately fond of war: they are perpetually embroiled in feud and bloodshed: even their courtship consists in a violent abduction of the object of their desire: through life, their women are treated with unparalleled cruelty. They are most disgustingly filthy in their persons, and gluttonous in their eating; their dances betray the licentiousness of their morals: they are all but incapable of civilization.

ALFORIAN FAMILY.

The Alfoers or Horaforas appear allied to the Australians. They are most numerous in New Guinea and the Moluccas, and, as Dr. Prichard suggests, may perhaps form a branch of the Australian stock. They have a flat nose, coarse long hair, large eyes, and projecting cheek bones.

TOLTECAN FAMILY.

Embracing all the civilized nations of Peru, Mexico, and Bogota. There is a great difference between the American and Toltecan families; the latter evincing existences of an advanced civilization.

LIBYAN FAMILY.

It is proposed under this name to include the various tribes of aboriginal Africans, who have long been

designated by the Arabic term Berbers. They are found to the north and south of Mount Atlas extending into Morocco and Barbary. The various tribes of this family are characterized by handsome Caucasian features, but in complexion they present all the shades from white to nearly black.

Such are the races of men. How different their complexions—how peculiar their formation! and yet Dr. Morton, after years of laborious research, comes to the same conclusion as the most distinguished writers on the varieties of the human species—viz. that the different races of men constitute but one genus and one species. The geographical distribution of the human race is doubtless one of the most interesting problems in history; the oldest records seldom allude to an uninhabited country; and we have already seen that seas and mountains have presented but trifling barriers to the peopling of the earth. The condition of our species under these infinitely varied circumstances is less the effect of coercion than of choice. Thus the Esquimaux, surrounded by an atmosphere that freezes mercury, rejoices in his snowy desert, and languishes in misery when removed to what we consider a more genial climate. On the other hand, the inhabitant of the burning plains of the torrid regions of Africa, oppressed by a vertical sun, and often delirious with thirst, fancies no other part of the world so delightful a paradise as his own. The arid province of Chaco in Paraguay, which the Spaniards describe “as a desert,” is the abode of forty Indian tribes who think no other part of the world so desirable or de-

lightful. Another singular circumstance may be mentioned illustrative of this subject, viz. that the most extensive migrations have been for the most part confined to the Temperate Zones. It is rare, for example, to discover the Polar tribe wandering to the south, or the people of the Torrid Zones attempting to establish themselves in a colder climate. It is in the civilized nations of modern times, in which the spirit of migratory enterprise knows no limit, that exceptions to this rule are to be discovered.

Certain marked and striking physical, as well as moral peculiarities, have from the remotest ages distinguished the inhabitants of every extended locality, common to themselves and sufficient to distinguish them from all other people. Precisely what they were in the days of the patriarchs are the Arabians at this moment; the Hindoos have changed in nothing since they were described by the earliest historians, and the skin and hair of the Negro have undergone no changes during three thousand years. In like manner the characteristic features of the Jews may be recognised in the temples of Luxor and Karnak, in Egypt, where they have been depicted for nearly thirty centuries.

“ This identity of physical characteristics (concludes Dr. M.) preserved through numberless generations, and often under very dissimilar circumstances, has occasioned various speculations in respect to the origin of the human family. The prevalent belief is derived from the Sacred Writings, which *in their literal and obvious interpretation*, teach us that all men have originated from a single pair; whence it has been hastily, and unnecessarily inferred, that the

“differences now observable in mankind, are owing
“solely to vicissitudes in climate, locality, habits of
“life, and various collateral circumstances. Without
“attempting to pursue this intricate subject in detail,
“we may inquire, whether it is not more consistent
“with the known government of the universe to sup-
“pose, that the same Omnipotence that created man,
“would adapt him at once to the physical, as well as
“to the moral* circumstances, in which he was to
“dwell upon the earth. It is indeed difficult to
“imagine that an all-wise Providence, after having by
“the deluge destroyed all mankind except the family
“of Noah, should have there to combat and with
“seemingly uncertain and inadequate means, the
“various external causes that tended to oppose the
“great object of their dispersion; and we are left to
“the reasonable conclusion, that each race was adapted
“from the beginning to its peculiar local destination.
“In other words it is assumed, *that the physical cha-
“racteristics which distinguish the different races, are
“independent of external causes.*”

This conclusion of Dr. Morton is highly probable; and such may have been the primitive distinctions among men; still hostile invasions, the migratory habits of some tribes, and the casual dispersion of others into remote localities, have a constant tendency to confound these peculiarities; and the proximity of two races has uniformly given rise to an intermediate

* Gen. ix. 25, 26, 27.

variety partaking of the characters of both, without being identical with either. Such are the mixed tribes found in different parts of the earth.

*The result of this investigation enables us to conclude, that the three sons of Noah overspread and re-peopled the earth. This is so expressly stated in Scripture, that had I not to reason against those who unhappily disbelieve such evidence, we might here stop. Let us, however, once more consider how far the truth of this declaration is substantiated by other evidence. Enough has been written to prove that there is a curious, if not a remarkable analogy between the predictions of Noah on the future descendants of his three sons, and the actual state of those races generally supposed to have arisen from them. Cuvier and other learned physiologists are of opinion that the primary varieties of the human form are but three; the Caucasian, Mongolian, and Ethiopian. This number corresponds with that of Noah's sons: assigning therefore the Mongolian race to Japheth, and the Ethiopian to Ham, the Caucasian, the noblest race, will belong to Shem the third son of Noah, himself descended from Seth the third son of Adam. That the primary distinctions of the human varieties are but three, has been further maintained by the erudite Dr. Prichard, who, while he discards the nomenclature both of Blumenbach and Cuvier, as implying absolute divisions, arranges the leading varieties of the human skull under

* Vide, a paper in Murray's Encyclopædia of Geography, p. 255,

three sections, differing from those of Cuvier only in name. That the three sons of Noah, who were "to replenish the earth," and on whose progeny very opposite destinies were pronounced, should give birth to different races is what might reasonably be conjectured. Still, that the observations of those who do, and of those who do not believe the Mosaic history, should tend to confirm its truth, by pointing out in what these three races do actually differ, both physically and morally, is, to say the least, a singular coincidence. In short, it amounts to presumptive evidence, that a mysterious and very beautiful analogy pervades throughout, and teaches us to look beyond natural causes, in attempting to account for effects, apparently interwoven in the plans of the Omnipotent.

CHAPTER IX.

CONCLUSION.

IN a work having for its object the investigation of the varieties of the *human race*, and the manner in which they may be accounted for, it is absolutely necessary to examine also, the peculiarities in form and structure observed in the inferior tribes of animals. This being the case, the idea occurred to me, in tracing the animal kingdom, from plant-animals to man, of giving at the same time, in each division, the classification of Cuvier.

The limits prescribed rendered such explanations of necessity, very brief; yet I trust the Student will have no difficulty in understanding them, and if a desire for more extensive reading be excited, abundant materials have been supplied by men who have devoted the whole of their lives to the study of natural history.

I have been most deeply indebted to many writers for several suggestions and illustrations, of which I never failed to avail myself when they tended, either to add to the interest of any part of the subject, or divest it of its obscurity. This obligation is not confined to this country. The opinions of several continental writers have also been clothed in an English

dress ; at the same time an earnest endeavour has been made to acknowledge in every instance the source, whence the information was derived.

“*Mirantur homines altitudines montium, ingentes fluctus maris, altissimos lapsus fluminum, et oceani ambitum, et gyros siderum—et relinquunt seipsos nec mirantur.*” This remark of St. Augustine refers to the trifling degree of interest men take in contemplating the phenomena of their moral nature, but till late years, the same censure applied to the want of curiosity displayed by man, in respect to the physical nature of his fellow creatures. In truth until the time of Blumenbach, little trouble had been taken about the matter ; his exertions were crowned with success, and aided by Dr. Prichard, Mr. Lawrence, and Dr. Morton, much has already been done ; still, notwithstanding their scientific labours, the investigation is even yet in its infancy. Their works are also frequently written in a style which adapts them rather for the professional than the general reader, and many of them are published at a price which places them far beyond the reach of numbers.

One great object in writing this book has been to divest the argument of its technicalities, to render the investigation accessible to all, and to urge the young aspirant for medical honours, earnestly to study comparative anatomy ; at the same time the publisher has been confined to a price that will enable all classes of society to obtain it. Cheap publications, containing much that is objectionable, are daily brought forth by the press, aided by the power of steam, and it certainly appears desirable that the *bane* should not be more

easily procured than the *antidote*. Next to the book of God (a copy of which can now be printed in a minute,) the book of nature ought most attentively to be studied, and every facility afforded, to enable the citizen to contemplate its beauties, to dwell upon its sublime truths, to climb the heights of heaven, and to view in every page the wisdom of creative skill. Every part of the earth—the highest cliff, the lowest cavern ; —every season of the year—the opening buds of spring, the warm luxuriant blossoms of full-blown summer, the yellow bower of autumn, and the leafless desolate groves of winter alike open a wide field for amusement and research. Thus science, the advocate of no party or country, but the beneficent patroness of all, has most liberally opened a temple, all may freely enter, never allotting a higher or lower place to exaggerated national claims, or national antipathies. Her influence upon the mind, like the sun-beam on the frozen earth, has long been making it ready for further improvement and higher cultivation. In this temple, all the members of the great human family, whatever their colour, age, sect, or country, are regarded as brothers, and considered as superior the one to the other, in proportion as they have laboured, and are labouring, to increase the sphere of human happiness, by spreading universally the reign of truth. From some we may differ in opinion, but still our fellow-labourers must be treated with kindness and respect, and it is the part of every man of science to say—

“*Amicus Socrates, amicus Plato, sed magis amica Veritas.*”

It may perhaps be asked, if these pursuits are within that portion of the field of science which may be considered the territory of the surgeon or physician. That they are foreign to surgery cannot be denied, if it is to be regarded as a manual art, and strictly confined to the application of a bandage, or the performance of an operation; and if we (I address myself to the members of my profession,) feel that our rank is higher than can be maintained, let the barber and surgeon again be united, and let us descend to the condition of an humble, insignificant class.

“The medical character,” says Mr. Lawrence, “is generally received as a certificate of education and knowledge, and it is a passport of admission into the most cultivated society. A perfect acquaintance with general knowledge (particularly natural history), is expected of us and is absolutely necessary to answer the appeals which are constantly made to us in the course of conversation. In the present day professional characters are estimated, fairly enough, according to the proportion of their knowledge and active talent; the efficacy of names and titles, like the fashion of wigs and canes, is gone by without a chance of revival.”

Every department of science is making rapid steps towards perfection. Our profession I am willing to hope has not been behind in the general wish for improvement, but the foundation is only yet laid, the building must be the work of succeeding labourers. Onward flows the torrent of human improvement and mental culture; such as refuse to launch their bark upon that stream, will most certainly be left far behind, and stranded upon the barren rock of ignorance and

sloth, will serve as beacons to warn succeeding generations; as logs by which to calculate the force and rapidity of the current by which they have been left so far behind.

Lastly, may I be allowed to say, that in order to do justice to an argument of this nature, the most patient thought and undivided study is required. But the time of a professional man is seldom his own; summoned one moment to remove the pressure of excruciating pain, at another to protract the approach of that awful hour—of that last trial from which every sentient creature shrinks; or to soothe the bitter anguish which is felt by relations when parted from some dear object of their solicitude. The responsibility attached to these decisions, on which depend whether the beloved wife or husband shall be saved—whether children shall be robed in health, and restored to their anxious parents, or parents be preserved for the sake of their families, leave few hours at our command, and do not fail to bend with anxious care the most iron-nerved man. Thus the only portion of time at my command being that which the wearied mind would fain devote to the refreshing slumbers of forgetfulness, rather than again engage in active thought, I have had many interruptions to a regular course of study, and instead of being able to follow up my reasonings methodically, have often had to regret their being broken, and the idea once banished by the more important duties of my profession, it was frequently no easy task to resume the argument. Thus seizing opportunities as they offered, and taking as the text the notes of a course of lectures delivered at different

times during a period of some years, I have often written in a hurried and desultory manner, and have, I fear, been led now and then into some repetitions. Be this however as it may, when an author appears before the public, urged by whatever motive, he must naturally expect that his work will be estimated according to what it is, and not according to contingencies, which might have tended to make it more or less perfect.

In the preparation of these sheets for the press, I have experienced but one source of disappointment, one which every person engaged in the active duties of a laborious profession must feel, when required to write on a subject, to a certain extent distinct from his more immediate duties, and demanding a much larger portion of time than his more important engagements will permit of his devoting to it, and which can only be supplied by curtailing the hours usually allotted to repose—this arises from a feeling of regret that the pen of one more able had not been devoted to the task, than of him who now offers the present work to public notice, in the hope of removing some of the difficulties arising in the investigation of the many interesting facts connected with the animal kingdom, and of shewing the harmony existing between the volume of nature and the volume of God.



DIRECTIONS TO THE BINDER FOR PLACING THE PLATES.

- Plate I..... To face the Title.**
Plate II. Opposite to page 55.
Plate III. 73.
Plate IV. 87.

